A STUDY ON
SANTHUVATHAM
(Polyarthritis)

Dissertation Submitted To

THE TAMIL NADU Dr. M.G.R. Medical University

Chennai – 32

For the Partial fulfillment for the Award of Degree of

DOCTOR OF MEDICINE (SIDDHA)

(Branch – III, SIRAPPU MARUTHUVAM)

DEPARTMENT OF SIRAPPU MARUTHUVAM

Government Siddha Medical College

Palayamkottai – 627 002.

OCTOBER - 2018

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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **"A STUDY ON SANTHU VATHAM"** is a bonafide and genuine research work carried out by me under the guidance of **Prof. Dr. A. S. POONGODI KANTHIMATHI., M.D(s).,** HOD, PG - Department of Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai and the dissertation has formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

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INGREDIENTS OF SANTHUVATHA CHOORANAM

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1.	Chithiramoolam	Plumbago zeylanica	Plumbaginaceae	Root
2.	Mavilingum	Crataeva magna	Capparaceae	Bark
3.	Sarakonrai	Cassia fistula	Caesalpiniaceae	Root
4.	Murungai	Moringa oleifera	Moringaceae	Root
5.	Erukku	Calotropis gigantea	Asclepiadaceae	Root
6.	Vembu	Azadirachta indica	Meliaceae	Root
7.	Thippli	Piper longum	Piperaceae	Fruit
8.	Vellaruku	Enicostemma axillare	Gentianaceae	Root
9.	Milagu	Piper nigrum	Piperaceae	Unriped Fruit

INGREDIENTS OF VATHA ENNAI

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1.	Poondu	Allium sativum	Liliaceae	Bulb
2.	Vasambu	Aconus calamus	Acoraceae	Rhizome
3.	Perungayam	Ferula assafoetida	Apiaceae	Dried latex(gum oleo resin)
4.	Chukku	Zingiber officinale	Zingiberaceae	Rhizome
5.	Milagu	Piper nigrum	Piperaceae	Unriped Fruit
6.	Thippili	Piper longum	Piperaceae	Fruit
7.	Omam	Trachyspermum ammi	Apiaceae	Fruit
8.	Kirambu	Syzygium aromaticum	Myrtaceae	Flower bud
9.	Sathakuppai	Anethum graveolens	Umbelliferae	Seed

10.	Kadugu rokini	Picrorhiza Kurroa	Scrophulariaceae	Rhizome
11.	Chithiramoolam	Plumbago zeylanica	Plumbaginaceae	Root

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METALS & MINERAL INGREDIENTS OF SANTHUVATHA CHOORANAM

S.NO	TAMIL NAME	ENGLISH NAME
1.	Kariuppu	Table salt
2.	Indhuppu	Rock salt
3.	Kaluppu	Himalayan Crystal salt
4.	Valayaluppu	Selvitri,Glass gall
5.	Vediuppu	Salt petre

S.NO	TAMIL NAME	ENGLISH NAME	ZOOLOGICAL NAME
1.	Sangu	Conch shell	Turbinella rapa

Station: Palayamkottai.

Date: 14.06.17

Authorized signature 14/06/17

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"..SANTHUVATHA CHOORANAM (Internal), VATHA ENNAI (External)" for the treatment of ……"SANTHUVATHAM"…… had been approved by the screening committee.

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Guide	Dr.A.S.Poongodi kanthimathi. M.D (s) Professor &Head of the Department
Dissertation topic	An open clinical Study to evaluate the clinical efficacy of siddha sasthric formulation "**SANTHUVATHA CHOORANAM**"(Internal) "**VATHA ENNAI**"for the treatment of **SANTHU VATHAM.**
Document field	1. Protocol2. Date Collection Form 3. Patient Information Sheet 4. Consent form5. SAE (Pharmacovigilance)
Clinical / Non Clinical trial Protocol	Clinical trial protocol – Yes
Informed consent document	Yes
Any other document	Case sheet, Investigation document
Date of IEC approval & it's Number	GSMC/3.IEC/2016/III-23/20.07.16

We approve the trial to be conducted in its presented form.

The Institutional Ethical committee expects to be informed about the process report to be submitted to the IEC at least annually of the study, any SAE occurring in the course of the study and changes in the protocol and submission of final report.

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INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN CHEMISTRY AND PHARMACEUTICAL SCIENCES (IJCRCPS)
ISSN : 2348 - 5213 (PRINT); ISSN : 2348-5221 (ONLINE)
www.ijcrcps.com
IMPACT FACTOR:6.988; ICV:57.67

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IJCRCPS
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INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN BIOLOGY AND MEDICINE
ISSN: 2455-944X
e-ISJN: A4372-3062; p-ISJN: A4372-3065
www.darshanpublishers.com
IMPACT FACTOR: 2.795, ICV:84.13 (2016)

CERTIFICATE OF ACCEPTANCE

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ACKNOWLEDGEMENT

The author is indebted to Lord Almighty who accredit the author with His blessings and grace to accomplish this dissertation work auspicious.

I take this opportunity to express my gratitude to the Vice Chancellor, The Tamilnadu Dr.M.G.R. Medical University, Chennai and The Director. Directorate of Indian Medicine and Homeopathy, Chennai who flagged my dissertation with cheer.

I obliged to **Prof. Dr. R. Neelavathy, M.D.(s), Ph.D.,** Principal, Government Siddha Medical College, Palayamkottai and **Prof. Dr. S .Victoria M.D (s)** Vice - Principal, Government Siddha Medical College, Palayamkottai for susceptible me to use of facilities available in this institution to bring out the dissertation in prosperous.

The author is grateful to **Dr.A.S.Poongodi Kanthimathi.,M.D(S).,** Professor, Head of Department of Sirappu Maruthuvam, (P.G III),Government Siddha Medical College, Palayamkottai for her inspiration, proposition and valuable advice regarding these studies.

I would like to show my appreciation to **Dr.M. Ahamed Mohaideen, M.D(s).,** Associate Professor**,** Department of Sirappu Maruthuvam, (P.G III),Government Siddha Medical College, Palayamkottai for his benevolent guidance and full synergy to complete the dissertation.

I would relish to show my gratefulness to Lecturer (Grade II) **Dr.S.Sujatha M.D(s).,** for her kind advice and good co-operation to make the easy way to complete the dissertation.

I would like to show my gratitude to Lecturer (Grade II) **Dr.G.Ganesan M.D(s).,** for his kind guidance and good co-operation.

I would thank to Lecturer (Grade II) **Dr.R. Vanamamalai M.D (s)** for his kind guidance and good co-operation.

The author is thankful to **Mrs.Nagaprema M.Sc.,** Head of the Department Biochemistry, Government Siddha Medical College, Palayamkottai for all technical assistants of clinical laboratory for their help in evaluating the trial drugs.

The author is so grateful to **Dr. Mr. .Kalaivanan M.Sc.,M.Phil.,Ph.D** Lecturer, Department of Pharmacology, Government Siddha Medical College, Palayamkottai in carrying out the Pharmacological analysis of the trial drugs, needs appropriate mention and appreciation.

I express my thanks to **Dr.S.Sudha, M.Sc., M.Ed., Ph.D.,** Associate Professor, Department of Medicinal Botany, Government Siddha Medical College, Palayamkottai for the guidelines in identification of herbal drugs.

I sincerely thank the great **Siddhars** who show me the right pathway in Siddha system. My heartful thanks to my colleagues and juniors for sustaining in many mode.

Finally, I am very thankful to **Mr. M. Maharaja**, for his kind co-operation in bringing out this dissertation work in an prime configuration.

INTRODUCTION

The universal usage of traditional knowledge and skills to address the variety of health needs exists across cultures. Today a large number of medicinal plants have found their way into the modern scientific pharmacopoeia. Across cultures, traditional medicine centers on integrating the emotional .physical ,mental and spiritual aspects of being ,aiming to restore a state of systemic balance between the individual and nature .D.C j ayasuriya and Shanti jaya surya define the practices of traditional medicine as "covering consultative ,diagnostic and care procedures that make exclusive use of traditional methods"

From the side of the world health organization as well as from national governments ,there is now a global push to recognize ,protect and regulate traditional medicine knowledge ,training and practice.

Legislation concerned with monitoring traditional medicinal products include the Indian Drug and Cosmetic Act 1940 ,Dangerous Drug Act 2000, India's 2005 Patent Act .

The WHO notes, however that "inappropriate use of traditional medicines or practices can have negative or dangerous effect "and that "further research is needed to as certain the efficacy and safety" of several of the practices and medicinal plants used by traditional medicine system. In some Asian &African countries,upto 80% of the population relies on traditional medicine for their primary health care needs.when adopted outside its traditional culture,traditional medicine is often called alternative medicine.practices known as traditional medicine includes Ayurveda , siddha medicine, unani, traditional chinese medicine ,traditional Korean medicine, acupuncture, Islamic medicine.

Among those traditional medicine , siddha medicine is more popularly in Tamilnadu .siddha medicine is based on philosophy. Siddha medicine is a subsidiary of saiva which appeared before 12,000 years

"தமிழ்மண் டலமைந்துந் தாவிய ஞானம்
ஊமிழ்வது போல வுலகந் திரிவார்
அவிழு மனமுமெம் மாதி யறிவுந்
தமிழ்மண் டலமைந்துந் தத்துவ மாமே''

-Thirumoolar thirumanthiram

Siddhars are those who lived and maintained their bodies as they desired best. They had investigated that the body ,though transient was the one and only instrument

for attaining success in the spiritual development and growth and so worked out to attain the eight super natural powers, as anima , magima, lagima etc., essential for their goal,as mentioned in silappathigaram.

According to agathiyar rathina surukkam nadi,disease are classified into 4448 types. Medicine is classified into two types .they are agamarunthu & puramarunthu ,each classification has 32 classification. The structural aspect of the human body is "udal thathus" and functional unit is" uyir thathus". Since olden days, the treatment of vatha disease in siddha system has been very much popular and effective varma points are the every residing in the body. The stimulation of varma points are useful in treating vatha diseases.

In yugi vaithiya chinthamani ,yugimunivar has explained 84 types of vatha diseases. Santhuvatham is one among them. According to this study ,"santhuvatham "is correlated with "polyarthritis"in modern medicine. The common symptoms are pain in the joints,alteration in the gait ,malaise ,excessive salivation.

Ref: yugi vaithiya chinthamani

Polyarthritis is the chronic inflammation of the synovial membrane of several joints. It involve 5 or more joints simultaneously. It is may be experienced at any age and is not gender specific.

Ref: principle and practice of medicine- Davidson

The medicine santhuvatha chooranam (internal) Ref: athmarakshamirtham,pg no 312 & vatha ennai (external) Ref:agasthiyarvaithiya soothiram 650 ,pg no 280,281, are indicated for vatha disease in siddha literature. They contain ingredients ,which have anti-inflammatory property. Considering this they are chosen as trial medicines in this study. The effectiveness of varmam , pottanam in alleviating pain in snthuvatham is also evaluated along with trial medicines.

The author postulate that the dissertation work might arise new attitude in their field especially in the treatment of santhuvatham.

AIM AND OBJECTIVES

AIM

Phase II clinical study on "SANTHU VATHAM" (polyarthritis) and the drug of choice is "SANTHUVATHA CHOORANAM" (internal), "VATHA ENNAI" (external),"SNEGHA POTTANAM"and VARMAM.

OBJECTIVE:

Primary objective

To evaluate the Therapeutic efficacy of SANTHUVATHA CHOORANAM (INTERNAL) & VATHA ENNAI (EXTERNAL) in the treatment of SANTHUVATHAM.

Secondary objective:

1. To evaluate the effect of varmam,pottanam in the management of SanthuVatham.
2. To evaluate the Siddha cofactor towards the efficacy of the trial drug SANTUVATHA CHOORANAM AND VATHA ENNAI and to evaluate the pharmacological actions.
3.

STUDY DESIGN & CONDUCT OF STUDY:

Study type	:	prospective open labelled phase II clinical criteria based study .
Study Place	:	OPD & IPD of Government Siddha medical College & hospital, Palayamkottai.
Study Period	:	24 Months
Sample Size	:	40 Patients (20 OPD & 20 IPD).In IPD-10 Patients with trial medicine and pottanam, 10 patients with trial medicine and Varmamam.

PRIMARY STUDY END POINTS:

The primary endpoints to be measured in this study include

- X-rays will be taken once in two weeks and assessed for improvement.
- Urine and blood samples will be collected once in two weeks and analyzed.

- The prognosis of inflammation will be measured by a measuring tape,twice in a week.
- Number of visit to the OPD will be noted.patient will be asked to come to OPD weekly thrice. (Monday, Wednesday &Friday) for 6 weeks.

SECONDARY STUDY END POINTS:

The secondary endpoint to be measured is evaluated relief in symptoms in subjects under study 3 times at weeks.

PRIMARY SAFETY END POINTS:

The primary safety endpoint will be measured and collection of any serious adverse event that occurs from initial study treatment through and including 30 days after cessation of study treatment.

REVIEW LITERATURE

SIDDHA ASPECTS

Definition of vatham

Vatham is one of the three humours namely vatham, pitham and kabam and it consists of vayu (air) and aahayam (sky). The two other dhosas are set in motion by the vatha. In a healthy man the existance of three humours are in the ratio of 1: ½ : ¼ respectively. This ratio is altered when there is a disturbance to the vatha by environmental factors, diet, habits etc., and vatha may be increased or decreased. When the equilibrium state is disturbed, vatha is altered, the other two also altered and leads to vatha disease.

Elements which become thodams in the body

Aahaayam (space) Vayu (air) Vatha thodam

Thee (fire) Pitha thodam

Appu (water) Piruthvi (Earth) Kaba thodam

According, the siddhar yugi described many vatha diseases so many decades ago approximately 7th century. He classified the diseases under three thosas such as vatha, pitha, and kaba. According to this classification vatha noi are further classified into 80 types. In that, yugi described many type of poly arthritis conditions. Santhu vatham is one of them. The symptoms of the Santhu vatham are body pain, mmalaise, giddiness, salivation, depression etc.

SYNONYM

SANTHU VATHAM = SANTHU + VATHAM, SANTHU – joints, VATHAM – Derangement of the vatham constituent therefore, we can say that santhu vatham means the joints are affected by derangement of vatham.

In siddha system of medicine, a human being is composed of 96 basic principles, among them the first thirty is considered very vital and the rest are the manifestation on extension of the first 30 principles. These thathuvas are universal to all human beings in normal condition. This not only consist of the physical components of the human body but also the mental, intellectual components like passions, qualities, knowledge, functions of the sense and motor organs and also their coordination.

Pancha boothas are the foundations for three dosham vatham, piththam, kabam which are the pillars that support our body structure.

✓ Vaayu constitute vatham

✓ Theyu constitute piththam

✓ Appu constitute kabam

Any alterations in the level of mukkuttrams affect the normal functions of the body. This is obvious from the verses.

"மிகினும் குறையினும் நோய்செய்யும் நூலோர்
வளிமுதலா வெண்ணிய மூன்று"

-திருக்குறள் (மருந்து)

The food we eat has six tastes namely sweet, sour, salt, bitter, pungent, astringent. Each of them is a mixture of two basic elements.

இனிப்பு	-	மண் + நீர்
புளிப்பு	-	மண் + தீ
உப்பு	-	நீர்+ தீ
கைப்பு	-	வளி + ஆகாயம்
துவர்ப்பு	-	மண் + ஆகாயம்
கார்ப்பு	-	வளி + தீ

Relationship between Vatham and Suvai

Aggravating tastes

"புளிதுவர் விஞ்சுங்கறி யாற்பூரிக் கும்வாதம்
ஒளி யுவர்கைப் பேறில் பித்துச் சீறும் - கிளிமொழியே
கார்ப்பினிப்பு விஞ்சிற் கபம்விஞ்சு ஞ்சட்டிரதச்
சேரப்புணர் நோயணுகாதே"

- கண்ணுசாமியம்

According to this poem the sour and astringent tastes increase the vatha humour.

Neutralising tastes

"வாத மேலிட்டால் மதுரம் புளியுப்பு
சேதமுறச் செய்யுஞ் சிறையைம் - ஓதக்கேள்
காரந் துவர்கசப்புக் காட்டுஞ் சுவையெல்லாம்
சாரப் பரிகாரஞ் சாற்று"

- கண்ணுசாமியம்

According to this poem sweet, salt and sour can neutralise the vitiated vatha humour. Fate of three humours

“அறிந்திடும் வாதமடங்கு மலத்தினில்
பிரிந்திடும் பித்தம் பேராஞ்சலத்தினில்
மறிந்திடுமையம் வசிக்கும் விந்துவில்
உறைந்திம்மூன்றுக் குறவாந்த லமிதே”

- திருமூலர்

From the above quoting, it is clear that the three humours can be discharged through the following routes.

Vatha - Faeces

Pitha - Urine

Kaba - Semen(sukkilam) /suronitham

Formation of vatham

“வந்த கலை மூன்றில் வாயுவாம பானனுடன்
தந்த பிராணன் சமானனும் சந்தமுறக்
கூட்டுறவு ரேசித்தல் கூறும் வாதம்
பித்தம்நாட்டுங் கபமேயாம் நாடு”

- கண்ணுசாமியம்

“இருப்பான நாடி எழுபதோடீ ரா
யிரமான தேகத்தில் ஏலப் - பெருநாடி
ஒக்கத சமத்தொழிலை யூக்கதச வாயுக்கள்
தக்கபடி யென்றே சாரும்
சாருந் தசநாடி தன்னில் மூலம் மூன்று
பேருமிடப் பிங்கலையும் பின்னலுடன் - மாறும்
உரைக்க விரற் காற்றொட்டுணர்த்துமே நாசி
வரைச் சுழியோமையத்தில் வந்து”

- நோய்நாடல் நோய்முதனாடல்

According to this the human body is composed of 72,000 naadi narambukal. Among this 72,000, ten are prominent naadies (Dasa naadies). Of these ten naadies, Idagalai, pingalai and suzhumunai are known as moolaathara naadies.

Among the ten vayus five are more important. These are piranan, abanan, viyanan, udhanan and samanan.

அபானன்	+	இடகலை	=	வாதம்
பிராணன்	+	பிங்கலை	=	பித்தம்
சமானன்	+	சுழுமுனை	=	கபம்

Abanan in conjunction with idagalai to produce vatha.

Piranan in conjunction with pingalai to produce pitha and samanan in conjunction with suzhumunai to produce kapha.

These three humours or thadhus i.e., vatha, pitha and kapha are the functional principles in the composition and substance of the body.

Location of vatham

Below the navel

"நாமென்ற வாதத்துக் கிருப்பிடமே கேளாய்
நாபிக்குக் கீழென்று நவிலலாகும்"

\- யூகிமுனி

Location

Vatham lives in

- ✓ Abanan Stools
- ✓ Idakalai
- ✓ Undhiyin keezh moolam
- ✓ Kaamakodi
- ✓ Hip bone
- ✓ Skin
- ✓ Nerves
- ✓ Joints
- ✓ Hair follicles and
- ✓ Muscles

Natural properties of Vatham

Physiologically

- ✓ Giving briskness
- ✓ Inspiration and expiration
- ✓ Functioning the mind, thoughts and body
- ✓ Regulation of the fourteen physiological reflexes (vegangal)
- ✓ Uniform function of the seven udal kattugal
- ✓ Protection and strengthening of the five sensory organs.

SIGNS AND SYMPTOMS OF VATHA DISEASE:-

- ✓ Pricking pain
- ✓ Dull pain
- ✓ Aching pain

- ✓ Tremors
- ✓ Palpitation
- ✓ Spasm
- ✓ Dryness or dehydration
- ✓ Dislocation of joints
- ✓ Weakness of the body
- ✓ Paralysis
- ✓ Constipation
- ✓ Oliguria
- ✓ Excessive thirst
- ✓ Astrigent taste predominantly in the mouth
- ✓ Excretions like stools, urine, lacrimiation, sweat, becomes black in colour.

ATTRIBUTES OF VATHAM:

வாதத்தின் குணம்:

- ✓ வறட்சி - Dryness
- ✓ குளிர்ச்சி - Coolness
- ✓ அணுத்துவம் - Subtlety
- ✓ கடினம் - Roughness
- ✓ அசைத்தல் - Mobility

INFLUENCE OF VATHAM IN MONTHS:

"வாதவர்த் தன காலமேதோ வென்னில்
மருவுகின்ற ஆனி கற்கட மாதம்
ஆதனைப் பசியோடு கார்த்திகை தன்னில்
ஆடருமே மற்ற மாதங்கள் தன்னில்
போகவே சிமிக்கின்ற காலமாகும்"

- யூகி சிந்தாமணி

According to this poem vatha may be influenced in the following months normally. They are Aadi, Avani, Purattasi, and Iypassi.

AGONIST QUALITIES OF VATHAM: -

Normal qualities of vatha are,

- ✓ Dry
- ✓ Cold

- ✓ Subtle
- ✓ Rough
- ✓ Unstable
- ✓ Light

ANTAGONST QUALITIES OF VATHAM:

- ✓ Unctuous ‘Hot
- ✓ Solid
- ✓ Soft
- ✓ Stable
- ✓ Heavy

SIGNS OF HYPERVATHAM:-

- ✓ Constipation
- ✓ Abdominal disturbances
- ✓ Fatigue
- ✓ Depression of sense organs
- ✓ Giddiness
- ✓ Incoherent speech
- ✓ Rigors
- ✓ Insomnia
- ✓ Fond of eating hot food stuffs
- ✓ Emaciation with blackish discolouration
- ✓ Loss of vigour.

SIGNS OF HYPOVATHAM:

- ✓ Vague pain all over the body
- ✓ Low-pitched voice.
- ✓ Difficulty to do any work.
- ✓ Reduction of intelligence
- ✓ Syncope
- ✓ Symptoms of hyperkapha.

Classification of vadham

Vatha can be classified into ten types. This has been said in Yugimuni 800 as follows.

“முறையாம் பிராணனோ டபானன் வியானன்
மூர்க்கமா முதானனொடு சமான னாகம்
திறமை யாங் கூர்மனொடு கிருகரன்றான்
தேவ தத்த னொடு தனஞ் சயனுமாகும;”.

- யூகி வைத்திய சிந்தாமணி

1. Piranan
2. Abanan
3. Viyanan
4. Udhanan
5. Samanan
6. Nagan
7. Koorman
8. Kirugaran
9. Devadhaththan
10. Dhanajeyan

Each one is responsible for various actions within the body.

1. Piranan:- (Heart Centre)

It refers to the chest and it regulates the respiratory system and helps the digestive system.

2. Abanan:- (Muladhar Centre)

The type of vatha corresponds to the pelvic and it is the seat of kundalini energy and controls excretions such as sweating, evacuation of stools, ejaculation of sperms, micturition, menstruation and parturition(delivery of child). Abana vayu is one of the 14 physiological reflex actions (Vegas) of the body. When its expulsion ispartially or completelly obstructed it leads to diseases like vayu gunmam, kudal vatham, vali vatham.

3. Udhanan:- (Throat centre)

This corresponds to the pharyngeal plexus in the throat region and controls breathing and speech. It is also responsible for the physiological reflex actions like vomiting, hiccough, cough etc.

4. Vyanan:-

It helps in the circulation of energy through the entire nervous system and helps in the movements of various parts of the body. It is responsible for the tactile sensation.

5. Samanan: - (Navel centre)

This corresponds to the solar plexus etc. By balancing the other vayus, the six tastes, water and food any one of the vayus is affected, this samanan is also affected.

6. Naagan :-

It is responsible for the intelligence of an individual. It helps learning different arts, singing of good songs etc. It is responsible for blinking, opening of eyes and eyebrow raising.

7. Koorman :-

This is responsible for yawning, closing of mouth, yielding strength and also blinking. It helps closing and opening of the eyes and shedding of tears. It is responsible for the vision.

8. Kirukaran :-

It is responsible for the salivation in the oral cavity and mucous secretion in the nasal cavities. It is responsible for good appetite. It helps in meditation. It produces cough and sneeze.

9. Devadhathatan :-

It is responsible for the lazziness and also lassitude while waking up. It helps movements of the eyeball in various directions. It is responsible for quarrelling, arguing etc., and also for much anger.

10. Dhananjeyan :-

It is responsible for the swelling all over the body. It produces sensation of roaring like the sea in the ears. It leaves the body by blowing up the cranium on the 3rd day after death.

Classification of vatha diseases

In classification we can find different view regarding the number.

In Yugi vaithya chinthamani, Yugi says

"என்னவே வாதமது எண்பதாகும்" when ending a verse describing the names of the types of vatha, yugi again says the number as 80,

"தாக்கான வாதந்தான் எண்பதாகும்".

But in the concluding section of the yugi vaidhya chinthamani, the number of vatha diseases has been given as 84.

In Agasthiyar 2000,

“எண்பது வாதமிகு மிருவகைப் படுத்துக் காணில்
நண்புறு அரைக்கு மேலே நாற்பது வாதமாகும்
பண்சேரரைக்குக் கீழே பத்துநான் காகுமென்று
வண்டுசேர் குழலினாளே! வாதத்தின் கூறு தானே”

i.e. 40 types of vatha disease are in the upper half and 40 in the lower half of the body and the total number is 80.

CHARACTERISTIC FEATURES OF VATHAM:

“வாதமே கதித்த போது வாயுவ மெழும்புங் காண்டீர்
வாதமே கதித்த போது வாயுவந்திடுஞ் சன்னிதோஸம்
வாதமே கதித்த போது வல்லடுன்மெலிந்து கொல்லும்
-அகத்தியர்சிகிச்சாரத்னதீபம்

வாதம் மிகும் போது சன்னிதோடம் போன்ற பல வியாதிகள் வந்து சேரும் உடல் மெலியும்.

“வாதவீறு அன்னமிறங்காது கடுப்புண்டாம் வண்ணமுண்டாம்
மோதுகட்டு ரோகம் சுரமுண்டாம் மிருமலுமா முறங்காதென்றும்
ஓதுசுரிய வாத மனலாகு நடுக்க முண்டாம் பொருள்களாய்த்
தீதனவே நரம்பிசித்து சந்துகள் தோறும் கடுக்கும் தினமும் தானே”
- தேரன் வாகடம்

Loss of appetite, pain and discoloration, fever and cough, insomnia, tremors, pain in all the joints of the body are the characteristics of vatha diseases.

PITHAM:

Pitham is responsible for all the transformation. Pitham is located in urinay bladder, heart, head, umbilicus, abdomen, blood, sweat, skin and eye. Pitham is classified into 5 types. They are,

- Anar Pitham - Responsible for digestion of food.
- Ranjaga Pitham - Responsible for colour of blood.
- Sathagam - Located in heart and is responsible for normal activities of the body.
- Alosagam - Responsible for normal vision.
- Prasagam - Responsible for the complexion of skin.

KABAM:

Kabam stabilizes, maintains and lubricates all movements. Kabam is found in samanan, semen, brain, head, tongue, nose, bones, bone marrow, fat, nerves, chest, blood, large intestine, eye, stomach and pancreas. Kabam is classified into 5 types, they are:

- Avalambagam :

  Lung is the center for avalambagam. It controls all other forms of kabam.

- Kilethagam :

  Stomach is the centre for kilethagam. It gives moisture and softness to the ingested food and helps for digestion.

- Bothagam :

  Tongue is the centre for bothagam and it is responsible for the sense of taste.

- Dharpagam :

  Head is the centre for Dharpagam. It gives cooling effect to eyes.

- Santhigam :

  It lies in the joints and is responsible for the locomotive action of movable bony joints.

SANTHU VATHAM

Santhu vatham is one of the vaatha diseases which is described in "Yugi vaithya chinthamani".

Definition

The term santhuvatham denotes all kinds of joint disease caused by the derangement of one of the uyirthathus "Vatham".

In the same literature it is mentioned such type of joint disease as megasoolai under the chapter of "Soolai noikal".

SYNONYMS:

Santhuvali (சந்துவளி)

Moottuvali (மூட்டுவலி)

Megasoolai (மேகசூலை)

Mudakkuvaayu (முடக்கு வாயு)

Aama vatham (ஆமவாதம்)

Keelvayu (கீல்வாயு)

- Siddha maruthuvam

Santheega sleshmarogam (சந்திகசிலேஷ்ம ரோகம்)

Santhu vatham (சந்து வாதம்)

Soolaikattu (சூலை கட்டு)

Vathasoolai (வாதசூலை)

Vayu rogam (வாயு ரோகம்)

- Vaidya sara sangiraham

In vaidya sarasangiraham

Agasthiyar vaidhya kaviyam

Agasthiyar Gunavahada thirattu

Thirumoolar karukkidai vaidhyam 600,

Santhu vatham was explained in the name of soolai, because of excruciating pain caused by such diseases.

- Since it causes pain in the santhu or moottu, it is called as moottuvali or sandhuvali.
- Restriction of movements and in some cases even immobility of the joints can occur, so it may be named as mudakku vaayu or mudakku vaatham.

Thus the terms of this disease are named according to the cause, derangement of the uyirthathu, kurigunam, site of lesion, complication etc.

In TV Sambasivampillai medical dictionary Santhuvatham is described as

“சந்துவாதம் - பொதுவாக அழற்சியினால்
உடம்பில் முழங்கால் முதலிய பொருத்துகளை
தாக்கி வீக்கம் கண்டு, வலியுடன் கீல்களை
சுற்றியுள்ள சவ்வுக்கு காணும் ஓர் வாத நோய்”.

A form generally employed to inflammatory disease acute or chronic of the whole or greater part of the fibrous structures that constitute the formation of a joint-arthritis.

According to Yugi vaidya chinthamani

"சந்துகள் மிக திமிர்த்து உடம்மெல்லாம்
மிக நொந்து மயக்கம் வாய் நீருறல்,கைகால்
பூமியில் தரிக்கவொண்ணாது வலியை உண்டாக்கும்
வாதநோய்".

"Rheumatism is characterised by inflammation with the thickening of the fibrous tissues, body pain, giddiness, salivation and unbearable pain in the limbs rendering the patient unable to stand firmly".

According to Siddha maruthuvam (text book)

செய்கைதான் சந்துகளு மிகத்திமிர்ந்து
செடமெங்கு நொந்துமே மிகவழற்றி
நைகையாய் நளுத்துமே மயிர்க்கூச்சிட்டு
நாணியே முன்போல நடைகொடாது
மைகைதான் மயக்கமொடு வாய்நீறும்
வரண்டிடுமே நாவுதான டிக்கடிக்கு
கைகால்தான் றரணிதனிற் றரிக்கொணாது
சஞ்சலிக் குஞ்சந்துவாம் வாதங்கேளே".

Santhuvatham is a disease characterised by difficulty in walking and inability to do the works with hands and legs as usual due to stiffness of joints and pain of the body. Extra articular symptoms associated with this disease are excessive salivation, dryness of tongue, lassitude and lethargy.

It is a disorder of joints (santhu) where bone, muscles, tendons, ligaments and associated structures binds together, for the purpose of locomotion of the body, caused by deranged humour vaatha.

Many literature references reveals above mentioned conditions associated with pathological conditions of vatha derangement.

"வாதமே வாயுவாகும் வாதமே காலிற்சேரும்
வாதமே கன்னியொடு மருவிடில் வலிவுமுண்டாம்"

- பரராச சேகரம்

வாதமே கதித்தபோது வாயுவ மெழுப்பு மீரும்
சொல்லவே வாதமது மீறிற்றானால்
சோர்வடைந்து வாயுவினால் தேகமெங்கும்
மெல்லவே கைகால்கள சதியுண்டாம்
மெய்முடங்கும் நிமிரவொண்ணாத் திமிருண்டாகும்
மெல்லவே யுடல் பொருமுன் வயிறுளைக்கும்
விரும்பிய ன்னஞ் செல்லாது விந்துநட்டம்
கொல்லவே நாப்புக்கும் காய்ச்சலுண்டாம்
கூறினார் மாலையமுனி கூறினாரே''

- அகத்தியர் சிகிச்சா ரத்தின தீபம்

Manifestations of vaatha vitiations are pain in extremities and joints, abdominal distension, swelling, immobilization of joints and stiffness, perverted taste, anorexia, fever etc.,

According to Agasthiyar Rathina surukkam

The character of vatha vitiations are joint pain, fever, nausea, body aches, constipation and excessive sweating.

According to Theraiyar vagadam

Indicates vatha vitiation causes cough, loss of sleep, swelling of interphalangeal, tarsal, metatarsal joints and bony prominence, stiffness of the body and excessive salivation.In santhuvatham disease mostly affected types of pitham are sadhakam, ranjakam and prasaga pitham.

In Gunavagadam Noyin saram stated,

''திருத்தமாம் வாதத்தோடே தீங்கொடு பித்தம் சேரில்
பொருத்துகள் தோறும் நொந்து போகவேயிடிக்கும் சூலை''

When pitha dhosha associated with vatha causes joint pain. Other dhosha is kapha, kapha mainly regulates the fluid balance and structural component in all the tissues and organs of the body.

When vathakapha gets deranged,

''வளிமையுந் தன்னிலை கெட்டு
வலியுடன் வீக்கச் சுரமும் காய்ந்து
மூட்டுகள் தோறும் முடுக்கியே நொந்து

மூட்டுகள் தன்னில் நீரும் சுரந்து

தாங்கொணா வலியுடன் நொந்திடுமம்மே"

Its manifestation are pain, swelling and fever associated with unbearable pain of the joints and increased secretion of synovial fluid.

Aetiology of Santhuvatham

In yugi we cannot find any specific aetiology for santhuvatham, but causes for all types of vatha disease in general have been described.

"என்னவே வாதம்தா னெண்பதாகும்

இகத்திலே மனிதர்களுக் கெய்யுமாறு

பின்னவே பொன்தனையே சோரஞ்செய்து

பெரியோர்கள் பிராமணரைத் தூஷணித்தும்

வன்னவே வச்சொத்திற் சோரஞ் செய்து

மாதா பிதா குருவைம றந்த பேர்க்கும்

கன்னவே வேதத்தைநிந்தை செய்தால்

காயத்திற் கலந்திடுமே வாதந்தானே"

- யூகி வைத்திய சிந்தாமணி

Since vatha is responsible for nervous function, injudicious actions like, theft, unreligiousness, unlowyality, will affect the mind and soul will cause disturbance of uyirthathu – vatham.

According to Agasthiyar kanma kandam 300

"நூலென் வாதம் வந்த வகைதானேது

துண்மையாய்க் கன்மத்தின் வகையைக் கேளு

காலிலே தோன்றியது கடுப்பதே

கைகாலில் முடக்கியது வீக்கமது

கோலிலே படுகின்ற விருட்சமான

குழந்தை மரந்தனை வெட்டமேல் தோல்சீவல்

நாலிலே சீவசெந்து கால் முறித்தல்

நல்ல கொம்பு தழை மறித்தல் நலித்தல் காணே"

- அகத்தியர் கன்ம காண்டம் 300 பாடல்-56

In siddha system many disease are due to kanmam which means the deeds or bad committed by an individual in his previous and the present birth. The genetic disposition of certain disease are probably the result of kanmam. Kanmam may also precipitate vatha disease.

Clinical features of santhuvatham

"வாதபித்தக் கீல்வாயுவின் வருங்குறி சாற்றக் கேளாய்
ஏதமார் மந்த மேப்பம் இரைச்சலும் வயிற்றில் நாணும்
ஓதருங் குத்தல் வீக்கம் ஓய்தலின் எரிச்சலுண்டாம்
காதறுமுறக்க மின்மை காய்சலுங் காணுங் கண்டாய்".

\- சபாபதி கையேடு

- Indigestion (Mantham) Eructation - Yeppam
- Borborymus of the abdomen
- Pricking pain
- Burning sensation
- Swelling of the affected joints, fever, insomnia and lazziness.

Classification of Santhuvatha disease There are 80 types of vatha diseases are explained in Yugimuni vaidhya chindhamani among them, 11 types of vatha diseases are associated with poly arthritis.

They are

- Santhuvatham
- Vatha suronitham
- Kalanjaga vatham
- Uthira vatha suronitham
- Narithalai vatham
- Malaitha kambha vatham
- Vatha upakatham
- Kumba vatham
- Thandaga vatham
- Sagana vatham

In Agasthiar vaidhya kaviyam 5 types

- Vatha soolai
- Vatha azhal soolai
- Marbil soolai
- Azhal soolai
- Amavatha soolai

In Jeeva Rackchamirtham 7 varieties are explained as vatha, pitha, kapha, mukkuttra soolai, Ama soolai, sankara soolai and Gunma soolai.

There are additional 2 types in Anubava vaidya Devaragasiam

They are Mega soolai and Muri soolai .

In thirumoolar karukkidai vaidyam -600 5 types

- Vatha soolai
- Pitha soolai
- Kapha soolai
- Vatha pitha soolai
- Seezhmega vayu soolai

In Agasthiyar Gunavakadam

- Vatha soolai
- Vatha azhal soolai
- Azhal soolai
- Iya azhal soolai
- Seezhmega soolai

Thus many literaures mentioned joint disorders under the name of soolai.

Complications of Santhuvatham

As the disease progresses, joint diseases leads to deformity and immobilization of the limbs. In Siddha system such conditions are named as mudakku vatham,

"பத்திய வாதந்துயத்து பாகுமே பயித்தியத்தால்
எத்திய நரம்பிமுத்து மேலதுஞ் சுருண்டு கொள்ளும்
குத்தியே துளைத்தாற் போல் குடைந்து காலடைந்து காணு
மற்றிது முடக்கு வாதமா மெனக் கருதலாமே".

- யூகிமுனிவர் பெருநூல் வைத்தியகாவியம் -1000

It denotes, in mudakku vadha condition body will bend forward and rounding the shoulder probably due to vertebral column deformity (Hang dog position).

Piniyari muraimai

Diagnostic methods adopted in siddha system of medicine are formed as "Piniyari muraimai". It is based on the following principles.

1. Poriyal arithal
2. Pulanal arithal
3. Vinathal

Pori and pulan are the five organs of perceptions and their senses respectively.

Nose-smell, Tongue – taste, Eyes –vision, Ears & Skin – Auditory & touch. Porigal of patient and doctor are used by the physician as instruments.

Vinathal is a method of enquiring about the details of patient's complaints from his own words or from their attendant.

The above mentioned principles can be compared to that of interrogation and inspection, palpation, percussion, auscultation. The important method adopted to diagnose the disease is by means of "Envagai thervugal".

"நாடிப்பரிசம் நாநிறம் மொழிவிழி
மலம்மூத்திரமிவை மருத்தவராயுதம்"

- நோய்நாடல் நோய் முதனாடல் பாகம் I

It is considered to be physician instruments and this can be understand by following poem,

"தொடுக்கலுற்றறு அட்டவிதப் பரீட்சை தன்னை
துலக்கமுறும் பண்டிதரே தெளி வதாகப்
பகுக்காய நாடியை நீ பிடித்துப் பாரு
பகர்கின்ற வார்த்தை பார் நாவைப் பாரு
வகுக்கரிய தேகமென்றத் தொட்டுப் பாரு
வளமான சரீரத்தின் நிறத்தைப் பாரு
சகிக்கரிய மலத்தைப் பார் சலத்தைப் பாரு
சார்ந்த விழிதனைப் பார்த்து தெளிவாய் காணே"

- அகத்தியர் வைத்திய வல்லாதி 600.

Envagai Thervugal includes

Naadi, sparisam, naa, niram, mozhi, vizhi, malam, moothiram.

Naadi (pulse)

"அறிந்து பார் வாதமே தனித்த தானால்
அன்னம் போல் நடக்குமப்பா நாடி பாரு
சரிந்திடவே கால் முடக்கும்போது காட்டும்"

- அகத்தியர் ரத்தின சுருக்கம்

Vitiated vatha causes difficulty in walking or impaired function of lower extremities. The examination of naadi has been recognised as one of the principle means of diagnosis and prognosis of disease from times immemorial.

Sparisam (skin)

Skin examination can be made out by touch and reveals about warmness, chillness, dry, weeping, skin rough, smooth, soft, hard, tenderness or presence of ulcers, swelling, wrinkles, hair, pigmentation etc., Naa (Tongue)

The colour, character and condition of the tongue changes according to the changes in mukkutrum.

Niram (colour):

As vaatha is the root cause the colour of the patient's skin, tooth etc., should be dark or black in colour.

Mozhi (Speech):

Speech in vatha patients may vary according to the deranged dhosas and grade of the disease.

Vizhi (Eye):

Burning of the eyes, lacrimation, irritation, colour changes are also noticed under this group. In Santhuvatham patients no changes in the eyes.

Malam (stools):

In Santhuvatham patients stools should look in dark colour with constipation.

Moothiram (urine) :

"உறைந்த நீருங் கரு கருத்து
முறையாய் ரோகமு முண்டாமே"

-அகத்தியர் நாடி

"அரவென நீண்டிடின.ீதே வாதம்"

When the oil drop spreads like a snake it indicates vathaneer.

UYIR THATHUKKAL IN SANTHUVATHAM :-

Vatham

1.Pranan : Inspiration and expiration responsible for sneezing coughing and belching. Not affected

2Abanan : Act with downward movement .Affected (constipation).

3.Viyanan : Helps in various movements of body, responsible for sensation. Affected (Restricted movement of affected joints radiating pain also present with tingling sensation).

4.Udhanan : Regulates the higher functions of brain. Responsible for physiological reactions like hiccough and vomiting.Not affected

5.Samanan : Regulates all other vayus .Affected(Due to vyanan affected).

6.Nagan : Responsible for intelligence helps in opening and closing of eyes . Affected in aged pateints. (Acuity of vision is deminished.)

7.Koorman :Responsible for lacrimation . Helps in visualization of all things of world.

8.Devathathan: Responsible for lazziness. Rotation of eyeballs, Affected (Sleeplessness).

9.Thanajeyan : Responsible for tinnitus oedema.

Pitham

1.Anar pitham : Digests all the ingested particles.Affected(loss of appetite).

2.Ranjagapitham : Increases the blood and gives colour to the blood Affected(decreased Hb level.)

3.Saathaga pitham : Makes the work to complete what mind thinks to do. Affected (Restricted movements & pain present)

4.Prasaga pitham : Gives colours to skin. Not affected

5.Aalosaga pitham : Responsible for clear vision.Affected in old age peoples.

Kabam

1.Avalambagam : Controls other 4 types of kabam.Affected

2.Klethagam : Moistens the food.Not affected

3.Pothagam : Helps to know the taste.Not affected

4.Tharpagam : Gives cooling effect to the eyes.Not affected

5.Santhigam : Gives lubrication to joints.Affected (Pain and restricted movements present)

UDAL VANMAI:-

It means strength and vitality of the body and classified into three types.

- Eyarkai vanmai - Inherited immunity

- Kala vanmai - age, season and time
- Cheyarkai vanmai - improvement of 3 vitality obtained by diet, daytoday habits and physical exercises.

SEVEN PHYSICAL CONSTITUENTS OF BODY

1. Saaram : Strengthens the body and mind.Affected
2. Senneer : Preserves brightness, boldness, power& knowledge.Affected
3. Oon :Gives structure and shape to the body.Early stage - Not affected. Later stage - Affected
4. Kozhuppu : Responsible for movement lubricants the joint. Affected
5. Enbu : Responsible for joint movement. Affected
6. Moolai : Present inside the bones and gives strength to the bones.Not affected
7. Sukkilam or suronitham: Responsible for next generation of human beings. Not affected

Thinai (land and place)

The geographical distribution of the land is classified into five regions.

1.	Kurinji	-	Mountain and its surroundings
2.	Mullai	-	Forest and its surroundings
3.	Marutham	-	Field and its surroundings
4.	Neithal	-	Sea and its surroundings
5.	Paalai	-	Desert and its surroundings

Accordingly, vaatha diseases are common in neithal nilam. Palai nilam-common places for all types of diseases. Marutha nilam is good for all types of treatment and health.

Kalam

According to siddha system the year is divided into six seasons with reference to the position of earth and sun.

S.No.	Paruvakalangal	Kuttram
1.	Kaarkalam – (ஆவணி, புரட்டாசி)	August, September Vatham ↑ ↑Pitham ↑
2.	Koothirkalam -	October, November (ஐப்பசி, கார்த்திகை)Vatham (-)Pitham ↑ ↑

3. Munpanikalam - December, January

(மார்கழி, தை) Pitham ↑

3. Munpanikalam - December, January

(மார்கழி, தை) Pitham ↑

4. Pinpanikalam - February, March

(மாசி, பங்குனி) Kabam ↑

5. Ilavenilkalam - April, May

(சித்திரை, வைகாசி) Kabam ↑

6. Muduvenilkalam - June, July

(ஆனி, ஆடி) Vatham ↑

Kabam (-)Kaarkalam

"வெளிச் சுழல் தட்பத்தை விஞ்முட் சூட்டை
அளித்துரிக்கு நேர்செயுமால் யாக்கைக் - களி செரி
வன்னிய.ம்.கும் காணத்தால் வாதாதி முத்தோடம்
நன்னிலையில் நில்லா நவில்"

-மருத்துவ தனிப்பாடல்

These above mentioned poem stated that the kaar and muthuvenil kalam are seasons for vatha diseases.

SANTHUVAATHAM AFFECTED IN 96 THATHUVAM:

1. Bootham : Mun, Appu, Vayu andAagayam.
   Symptoms : Deranged vatham 4 boothams.

2. Pori : Mei (Aagaya bootham).

3. Pulan : Ooru
   Symptoms : Pain and tenderness

4. Kanmenthiriyam : Kaal and Kai
   Symptoms : Pain, numbness,weakness, destroying,loosening, burning.

5. Kanmavidayam : Kamanam, Thaanam
   Symptoms : Difficulty to normalmovements in limbs.

6. Naadi : Edakalai Pinkalai Suzumunai .Three humours are found by these naadies.

7. Vayu :

Piranan	-	Deranged vatham
Samanan	-	Vayu increased in joints
Devadathan	-	Drowsiness, tremor
Abanan	-	Constipation
Udanan	-	Salivation, dryness of mouth
Kirukaran	-	Salivation, mental agony

8. Kosam : Vali Udambu,Paru Udambu,Arivudambu,Inbaudambu Deranged three humoursand seven udal thathu, drowsiness, mentalagony, weakness.

9. Aatharam

Moolarthalam	-	Weakness
Swathitanam	-	Drowsiness
Manipooragam	-	Destroying
Anagatham	-	Burning sensation
Visutthi	-	Tremor
Aakinai	-	Dryness of mouth

10. Gunam : Thamo Kunam -Drowsiness,Mental agony character is one of the main etiology.

11. Vinai : Thivinai is one of themain etiology for the santhuvatham.

Uyir Thatukkal:

1. Vatham

Piranan	Deranged Vatham
Abanan	Constipation
Viyanan	Pain and numbness in joints
Samanan	Pain all over joints

Kirukaran	Salivation, mental agony
Devadathan	Drowsiness, mental agony

2. Pitham

Sathagam : Difficulty to work due pain and numbness, mental agony, tremor weakness

3. Kapham

Santhigam : Destroying, loosening, inflammation, burning sensation in joints, chillness of joints, weakness, pinching of joints.

Affected Udal thaathukkal

Symptoms

Saaram	Salivation, Dryness of mouth
Oon	Wasting, destroying, weakness
Kozhuppu	Destroying, Chillness, Inflammation, difficulty in movement of joints
Enbu	Burning Sensation of joints, loosening, pain in all over the joints

நோய் நிதானம் (DIFFERENTIAL DIAGNOSIS):

காளாஞ்சகவாதம் (Kalanjaga Vatham):

Though the patient had numbness in both upper and lower limbs, twisting pain in joints destroying and inflammation, difficulty to walk, emaciation, cripple, rigidity due to morbid enlargement, wasting in body, pallorness, itching, ulcer, deranged iyyam, indigestion, drowsiness, it is not santhuvatham.

வாதசுரோணிதம் (Vatha suronitham)

Though the patient had Wasting in whole body, swelling in joints, difficulty to walking, swelling in carpal joints, itching in all over the body, loss of appetite, coma, salivation, it is not sathuvatham.

உதிரவாதசுரோணிதம் (Uthiravatha Suronitham)

Though the patient had, swelling in ankle joint, knee joint and heel pain and inflammation in carpal and tarsal joints, drowsiness, exhausted, madness, deranged Azhal humour, loss of appetite, it is not santhuvatham.

மேகசூலை (Mega Soolai)

Though the patient had pain in lower back and both limbs, constipation absolute suppression of urine, sweating in both limbs, shivering, redness in lips, wasting, burning sensation all over the body, fever, thirst, perplexity, mental delusion, it is not santhuvatham.

வாதசூலை (VathaSoolai)

Though the patient had, pain in both limbs, numbness, coma, pain in the body, chillness, pallorness in body and face,pain in the thigh, burning micturation, haematuria, pain increase in the body, it is not santhuvatham.

பித்தசூலை (Pitha soolai)

Though the patient had wasting and emaciation, pain in both limbs and joints, deranged humours, pallorness in all over the body, drowsiness and delusion, it is not santhuvatham

Santhuvadham is differentiated from other types of keel vaayu as follows:

வளிஅழல் கீல்வாயு (Vali Azhal Keel Vaayu)

It is characterized by excruciating pain and swelling involved in toes, knee joints, hip joints, elbow joints, shoulder joints and associated with systemic disturbances like dryness of mouth, pyrexia, headache, palpitation, constipationand sweating. In advanced cases it may affect the heart and produce “Thamaraga Vaayu”.

ஐயகீல்வாயு (Iyakeel vaayu)

It is characterized by severe pain in the joints associated with emaciation of the body, anorexia, insomnia, cough, hiccough, vomiting, anemia and dropsy. The common sites are spinal cord, hip joint and knee joint VALI IYAKEEL VAAYU:

It is characterized by pain in the joints associated with effusions of joint fluid and swelling, restricted joint movements, pyrexia, fainting, insomnia, especially in knee joint asymmetrically, lymphadenopathy, generalized malaise, atrophy of the affected limb etc., The affected joint looks like “Fox’s head”.

LINE OF TREATMENT

According to siddha system, the main aim of the treatment is to cure physical illness and mental illness.Treatment is not only for complete healing but also for the rejuvenation .Siddha system of medicine has a sophisticated treatment modality. It not only cures the disease but it corrects the causative factors and insists to advise certain life style modification in order to prevent the disease again.

Thiruvalluvar says about physicians duty, study the disease, study the cause, seek subsiding ways and do what is proper and effective.

‘நோய்நாடி நோய்முதனாடி யதுதணிக்கும்
வாய்நாடி வாய்ப்பச் செயல்”

‘உற்றானளவும் பிணியளவுங் காலமும்
கற்றான் கருதிச் செயல்”

- திருக்குறள்

So it is essential to know the disease, the aetiology, the nature of the patient, severity of the illness, the seasons and the time of occurrence must be observed clearly.

Line of treatment is as follows:

In Siddha system line of treatment consists of the following

1.Neekam (Treatment)

2. Niraivu (Restoration of wellbeing)

3. Kappu (Prevention)

NEEKAM:

a) To bring the Three Thodams to equilibrium state.

b) To treat the patient by Internal and external medicines.

c) To stabilize seven Udal thadhukal and three Uyir thadhukal.

To bring the three Thodams to normal equilibrium state-by giving purgation.

Purgation drug:

Purgation was given in early morning for balancing the deranged mukkutram on the first day of the treatment. Next day onwards the trial drugs .SANTHUVATHACHOORANAM (internally) and VATHA ENNAI (externally) were given.

NIRAIVU:

By promoting the awareness about the dietary, seasonal, emotional influence on the disease assurance from disease recovery was given. Life-style modification was also advised to them.

KAAPU:

Knowing the cause there by removing it and thus preventing the disease is the main aim of Siddha system of medicine. Siddha system emphasizes the purification of thought and activities as mentioned in the siddha text "Theraiyar Pinianuga Vithi" which emphasizes virtueness to be followed even in the daily life activities.

DIETARY ADVICE:

In Siddha system of medicine the importance of dietary habits have been emphasized for the management of diseases and its prevention in a effective manner.

"கடுகு நற்றிலத் தெண்ணெய் கூழ்பாண்டங்கள்
வடூவ தாயே தெண்ணெய் கூழ்பாண்டங்கள் கடலை
மடிவி லாதவெள்ளுள்ளிகொள் புகையிலை மதுபென்
இடறு பாகலோ டகத்தி நீக்கிடலிச் சாபத்தியம்"

- சித்த மருத்துவாங்க சுருக்கம்

During the course of treatment, the patients were advised to follow certain diet regimen (Icha pathiyam) which is mentioned for vatha diseases.

1. Kadugu - Brassica nigra (Mustard seed)
2. Ell Nei - Gingelly oil
3. Poosanikkai - Bennicasa hispida
4. Kadalai - Arachis hypogea
5. Thengai - Coccus nucifera
6. Maangai - Mangifera indica
7. Poondu - Allium sativum
8. Pala - Artocarpus heterophyllus
9. Kollu - Horse gram
10. Pugaiyilai - Nicotiana tobaccum
11. Pagal-- Momordica charantia
12. Agathi - Sesbania grandiflora
13. Sour taste
14. Astringent taste

Substances used for neutralizing three humours are:

"ஒன்றிய வாதபித்த கபமிவை யுயரா வண்ணம்
நன்றறு கறி களெல்லாம் நாளுமே சமைப்பராய்தோர்
தின்றிடு மிளகு மஞ்சள் சீரக முயர்ந்த காயம்
வென்றி கொள் சுக்கோடேலம் வெந்தியம் உள்ளி சேர்தே"

- ப.கு.சி

To maintain three vital humours in equilibrium one should take food cooked with:

Pepper	-	Piper nigram
Turmeric	-	Curcuma longa
Cumin seeds	-	Cuminum cyminum
Asafoetida	-	Ferula asafoetida
Dry ginger	-	Zingiber officinalel
Cardamom	-	Elettaria cardamomum
Fenugreek	-	Trigonella foneum
Garlic	-	Allium sativum

Substances advised for vatha diseases are :

"செங்கழுநீர் கோடைத் தேன் மிளகு நல்லெண்ணை
தங்கு பெருங்காயத் தழுதாழை - எங்கெங்கும்
கட்டு சிறு முத்து நெய் கோதில் உளுந்துவைகள்
வாட்டு மணிலக்கை மதி"

- ப.கு.சி

Honey collected during summer

Pepper	-	Piper nigram
Gingelly oil	-	Sesamum indicum
Asafoetida	-	Ferula asafoetida
Castor oil	-	Riccinus communis
Black gram	-	Vigna mungo
Garlic	-	Allium sativum

சேர்க்கக் கூடிய உணவுகள்: (Diet to be included)

காய்கள் (Vegetables):

கத்தரிப்பிஞ்சு	-	Unripe brinjal
முருங்கைப் பிஞ்சு	-	Unripe drumstick
அவரைப்பிஞ்சு	-	Unripe broadbeans

கீரைகள் (Greens):

பொன்னாங்கண்ணி	-	Alternanthera sessilis
மூக்கிரட்டை	-	Boerhaavia diffusa
தூதுவேளை	-	Solanum trilobatum
முருங்கைக்கீரை	-	Moringa oleifera
கறிவேப்பிலை	-	Murraya koenigii
முடக்கறுத்தான்	-	Cardiospermum halicacabum
அறுகீரை	-	Amaranthus tristis
கரிசாலை	-	Eclipta prostrate

பழங்கள் (Fruits):

மாதுளை	-	Pomegranate
ஆப்பிள்	-	Apple
பப்பாளி	-	Papaya
ஆரஞ்சு	-	Orange
பேரீச்சை	-	Dates
அத்தி	-	Figs
நாவல்	-	Syzygium cumini

அசைவம் (Non-Vegetarian diet):

வெள்ளாட்டுக்கறி	-	Meat
காடை	-	Quail
சிறு இறால் மீன்	-	Prawn

VARMAM

Varmam is the vital energy point. The praanan flowing all over the body is channelized and stored at many points,from where it is distributed to the target regions.when these points are stimulated, by concentration or by physical touch, energy is generated and the regions under the control of each point, gets strengthened. If the stimulation goes beyond the limit,the energy point gets damaged.

Varmam points are present in the pathway of dasanaadi, dasavayu, saram and naanku kalai.so they are used to control energy channels, i.e. saram,dasanadi,dasavayu,kalai,amirtham etc. using these points,we can control and regulate the functions of the body.

Reason for varma impact:

Fall from trees,fall while running,striking stones,hitting by sticks of irregular shape leaping,receiving any hits of irregular sticks,sexual contact and intoxication.

Fall of hands and legs due to disorderly manner, while retrieving the patient, pressure exerted at the place beyond the required measure ,holding the breath while lifting the heavy load,pulling &holding others while fighting. These are some of the reasons, when the varma imacts occurs.

Sign &symptoms of varma impact:

Eye ball will go round and round. Black spot of the eye will disappear into the socket and give room for whiteness. Convulsions will arise with hiccup,the breath will be hold and passed out at low ebs. There will be swelling of the lower abdomen .If the signs are there ,the impact is of ordinary type.

The following all the incurable type of impacts.when the patient becomes unconscious. It is a serious type and life will depart from the body.

Analyzing the curable and incurable nature of the impact,one should enter into treatment and following the guide lines given by the guru.

Classification of varma:

Total varmams are 108 in number.

Inside womb only 8 varmams are present after 3 yrs, varmam start developing upto 12 years. All the varmam points get fully developed by the age of 23. Based on their energy level and effect, Varmam points are classified into two.

They are

- Padu varmam -12
- Thodu varmam-96
- Thattu varmam-8
- Ul varmam -6.(thattu varmam and ul varmam are included in thoduvarmam)

Varmam points for santhuvatham

Kai Kavli -Situate in Thumb and index figure.

Puyavarmam -Tip of the shoulder joint.

Muttusuzharchivarmam-Around the knee joint.

ArumugaAdangal-Persent in the upper, middle, lower border of the knee joint.

Nangana pootuvarman-Present in both sacroiliac joint

Mudichu varmam - It is located at the back in the cervical prominence at the c7, T1 junction.

Kakkattai kaalam - It is located in the supraclavicular fossa.

Manibantha varmam - It is located in the middle of the wrist joint.

Kuttikaal varmam - Situated 7 finger breaths above posterior aspect of the heel.

Viruthi kaalam - situated between big toe and adjacent in its dorsal aspect

Komberi kaalam: situated- 8 finger breaths above medial malleolus.

Pottanam:

The raw drugs or either pounded or leaves of medicinal plants are fried ,tied in a cloth piece as bundle. This medicated bundle is dipped in a particular medicated oil and then applied over affected area.it is effective in diseases due to the morbidity of kapha and vaatha dosham ,pain and swelling in the joints as well as paralysis.depending upon the requirement whole body below the neck or a part of the body may be treated by this procedure. Thokkanam followed by application of the heat with the warm packs of herbal powder for above 30 to 45 minutes is the method of pottanam.when the process is complete ,patient is given a bath in warm water . The above mentioned treatments can be done in a perfectly healthy person as well as to enhance his/her immunity ,vitality and longevity. This type of external application is comes under both manida maruthuvam(rat ional method) and asura maruthuvam (surgical method) agni or heat application.

SNEGHA POTTANAM

Nochi kolunthu,aamanaku illai,sirramanaku vidai,paruthikottai,theankai thiruval,veapamkottai,thazhuthalai kolzhunthu,punnai vethai,magilam vethai,samuthira palam,koliyavarai vethai.all the ingredients are keep in pottanam,dip in the heated neem oil,apply to the affected area for 15-30 minutes.

It cures the santhuvatham and some vatha diseases.

KAIKAVALI VARMAM

MOOTU SULARCHI VARMAM

SNEGA POTTANAM

MODERN ASPECT

Joint

A joint or articulation is the connection made between bones in the body which link the skeletal system into a functional whole.

Disease of joints:

Joint diseases form one of the most important groups of crippling diseases in the world . the most common cause of arthritis in india is due to the prevailing infections of various types ,whereas degenerative and metabolic joint diseases predominante in the developed countries.

Anatomical and physiological factors:

Synovial joint are those ,where two bones are connected by a fibrous capsule with a well defined space between them lined by the synovial membrane . the bone ends are covered with a layer of hyaline articular cartilage and in some joint .There are intra-articular cartilage acting as cushioning and shock absorbing structures.

The capsule is fibrous and is attached firmly around each articulating bone near the epiphyseal plate and in folded on itself to be attached to the periphery of the articular cartilage. The synovial membrane get reflected similarly.

The articular cartilage is a vascular. The nutrition to the superficial part is by seepage of the synovial fluid between the lamination of the chondroid and to the deeper part from the vascular channels of the subchondral cancellous bone.

Synovial fluid

It is a clear ,viscous, pale yellow fluid with a specific gravity of 1008 to 1015, which fills the synovial cavity. It is a dialysate of the blood plasma with mucin and hyaluronic acid added to it as secretions from the synovial cells. The main functions of the synovial fluid are lubrication and nourishment of the articular cartilage.

Analysis of the synovial fluid is helpful in diagnosing various types of arthritis by changes in its viscosity, cell content and biochemical features.

Classification:

Joints are subject to various types of disease and disorders. Disease of joint can be classified as follow

I.Infective arthritis:

Bacterial,viral and parasitic:

a) Acute infection

Acute pyogenic arthritis

Acute gonococcal arthritis

Acute rheumatic arthritis

Small pox arthritis

b) Chronic infections

Nonspecific : pyogenic arthritis

Specific : tuberculous arthritis

Syphilitic arthritis

Gonococcal arthritis

Parasitic : guinea worm arthritis

2. RHEUMATOID ARTHROPATHY:

a) RHEUMATOID ARTHRITIS

Rheumatoid Arthritis (Adult)

Juvenile Rheumatoid Arthritis(JRA)

b) SERO NEGATIVE SPONDYLO ARTHROPATHY:

Ankylosing spondylitis

Reiter's Disease

Psoriatic arthritis

Enteropathic Arthritis

3. DEGENERATIVE ARTHRITIS:

Osteoarthritis

1. Primary Osteoarthritis

2. Secondary Osteoarthritis

4. NEUROPATHIC ARTHROPATHY:

Tables – charcot's Arthropathy

Syringomyelia

Leprosy

Diabetes Mellitus

5.METABOLIC ARTHRITIS:

Gout

Alkaptonuric Arthritis

6.ARTHRITIS IN SYSTEMIC DISORDER:

Allergic arthritis

Haemophilic Arthritis

7. MISCELLANEOUS JOINT:

Villo – Nodular synovitis

Synovial Chondromatosis

8. HYSTERICAL JOINT

Arthritis

The word arthritis is derived from the greek words "arthro'' meaning joint and ''itis'' meaning inflammation. In dealing with a patient with arthritis it is important to categorize the underlying cause of arthritis as the management differs according to the aetiology.

PATHOLOGY:

Arthritis is the inflammation of all the component structures of the joint with involvement of the synovium, articular surfaces and capsule.

The following stages can be identified:

Stage of synovitis

Stage of reversible arthritis

Stage of irreversible arthritis

Stage of ankylosis

The critical stage of the disease is the involvement and destruction of the articular cartilage, as any gross damage to the cartilage is irreversible leading to ankylosis and loss of function.

Clinical approach to arthritis

History should be taken regarding the distribution of joint involvement,joint swelling,morning stiffness,extra articular features,if any ,family history of rheumatic disorders,past history of rheumatic symptoms, other disease and treatment history.arthritis can be classified as acute or chronic (6 to 8 weeks being the dividing line). It can be of adult onset or juvenile type. Depending on the total number of joints involved, arthritis can be divided into monoarthritis(one joint) ,oligoarthritis(2 to 4 joints),and polyarthritis (5 or more joints).polyarthritis can be symmetrical or asymmetrical .

Arthritis can be inflammatory or non-inflammatory. In inflammatory arthritis, morning stiffness is prolonged(more than 1 hour). In non-inflammatory arthritis, there is only 'gelling',lasting a few minutes after a period of joint immobility. In inflammatory arthritis ,improvement of joint symptoms occurs on joint usage , nights are worse than days, spontaneous flare ups are common ,constitutional features (fever,malaise,loss of appetite and weight) and elevated erythrocyte sedimentation rate (ESR) and C- reactive protein (CRP) are usual. These features are absent in non –inflammatory arthritis.

Examination should include the following peripheral and axial jonts (swelling, warmth, tenderness hypermobility and deformity); entheseopathy (tendo-achilles insertion ,plantar fascia);skin (subcutaneous nodules, rash); hair (loss of hair in scleroderma); nails (nail fold infarcts);eyes (episcleritis ,scleritis, conjunctivitis , iridocyclitis) ; oral mucosa and genitalia (ulcers) and systemic examination (hepatosplenomegaly, pericarditis, pleural effusion, pericardial effusion, lymphadenopathy).findings are best recorded around skeleton charts or homunculi for quick and easy comparison between visits to the clinic.

Arthritis may present as acute monoarthritis ,aute polyarthritis, chronic monoarthritis and chronic polyarthritis.

Acute monoarthritis

Differential diagnosis of acute monoarthritis includes trauma, septic arthritis , crystal arthropathy (gout ,pseudogout),haemophilic arthropathy ,monoarticular onset of chronic inflammatory polyarthritis. In the hip joint, transient synovitis, perthes'disease and psoas abscess should be considered. In the knee prepatellar bursitis should be excluded.

Chronic monoarthritis

Causes of chronic monoarthritis include osteoarthritis, tuberculosis ,brucellosis,pigmented villonodular synovitis, synovial chondromatoss ,initial presentation of chronic polyarthritis ,monoarticular rheumatoid arthritis or juvenile chronic arthritis, malignancy and neuropathic joint,causes of neuropathic joint include tabes dorsalis ,syringomyelia,leprosy, diabetes mellitus ,myelomeningocele, congenital insensitivity to pain and iatrogenic(repeated steroid injections).

Acute polyarthritis

Acute polyarthritis includes reactive arthritis (classical and non classical)and acute onset of chronic inflammatory polyarthritis. In classical reactive arthritis ,there is gastrointestinal or genitourinary infection initially. Arthritis follows infection a month later.lower limb joints are involved. Sacroiliac joint involvement and entheseopathy are common.patient is usually HLA B27 positive. If eyes are involved (conjunctivitis),reiter's syndrome, oral ulcers are not painful.scleritis ,cavitary nodules on chest X-ray ,sinusitis and haematuria should make the clinician suspect wegener's granulomatosis(scleritis is not common in rheumatoid arthritis). In non-classical reactive arthritis, there is no history of preceding infection. Other causes of acute polyarthritis include acute rheumatic fever ,polyarthritis following viral infections and polyarticular septic arthritis .

Chronic polyarthritis

Polyarticular asymmetrical arthritis is typically seen in sero-negative spondyloarthropathies (ankylosing spondylitis,psoariatic arthritis).

Causes of polyarticular symmetrical arthritis include rheumatoid arthritis,connective tissue disorders (systemic lupus erythematous,systemic sclerosis, polymyositis and dermatomyositis, CREST syndrome ,vasculitis, anti- phospholipid syndrome, polymyalgia rheumatica/giant cell arteritis,etc.),osteoarthritis ,polyarticular gout, pseudogout,poncet's disease (tubercular rheumatism) and arthritis associated with systemic diseases (bacterial endocarditis, HIV infection , endocrine and metabolic disease).

Features suggestive of systemic vasculitis are rash with purpura, peripheral neuropathy ,glomerulonephritis and evidence of regional ischaemia such as vasculitis are rash with purpura ,peripheral neuropathy ,glomerulonephritis and evidence of regional ischaemia such as vasculitic ulcers.SLE commonly presents as fever ,malar rash,alopecia,arthritis and oral ulcers. Anti-phospholipid syndrome presents with recurrent venous and /or arterial thrombosis ,recurrent fetal looss usually at around 10 weeks og gestation ,thrombocytopenia and/or hemolytic anemia. APS can occur secondary to SLE also . In fact, it was first described in patients with SLE .The characteristic serum markers for APS are family of autoantibodies reactive against different anionic phospholipid required in the formation of prothrombin activator complex of the blood coagulation cascade. The antibodies include the anticardiolipin antibody ,lupus anticoagulant, etc.

The initial symptom of systemic sclerosis (scleroderma) is usullay raynaud's phenomenon with or without puffiness of fingers.this may be accompanied by fatigue ,early morning stiffness and arthralgia. The tight skin typical of scleroderma may take years to develop . D- penicillamine is the mostly used drug in scleroderma. For severe Raynaud's phenomenon ,vasodilator drugs such as nifedipine or prazosin are used.

Seronegative inflammatory polyarthritis

Polyarthritis is a feature of a number of conditions vaguely related RA, psoariatic arthritis, jeuvenile chronic arithritis ,SLE and other connective tissue diseases.

Inflammatory polyarthritis

It usually involves the smaller joints as well and systemic features of inflammation are none marked.

Polyarthritis of the finger:

Polyarticular OA may be confused with other disorders which affect the finger joints.close observation slows several distinguishing features. Nodal OA affects predominantly the distal joints,rheumatoid arthritis the proximal joints,psoariatic arthritis in a purely destructive arthropathy and there no interphalangeal nodes.tophaceous gout may cause knobby fingers ,but the knobs are tophi ,not osteophytes .xrays will show difference.

Characteristics of inflammatory joint disorders:

1.significant early morning stiffness >30 minutes.

2.pain aggravation on resting the joints.

3.symptomatic improvement on gentle use of joints.

4.spontaneous flares (up –and –down course)are common.

5. constitutional symptoms-fatigue , loss of appetite ,weight loss ,low grade fever,night sweats are very often present.

6. Increased acute phase reactants eg.high ESR and CRF.

In non –inflammatory disorders, from 1 to6 ,respectively they are <30 minutes,pain on moving the jointS.NO. improvement ,uncommon, absent, and normal.

Pattern recognition in MSK disorders:

Pattern recognition in MSK disorders or rheumatological diseases is of immense importance to have a clean cut diagnosis.often features of two or more MSK disorders are present in a single patient to build up a diagnosis of ' overlap syndrome'. If the pattern of involvement is not recognized clinically, it is very difficult to clinch a

diagnosis of rheumatological diseases only by ordering of RF,ANA,autoantibodies or other immunological markers.

1. Mode of onset :acute or insidious.
2. Duration of joint pain :acute <weeks or chronic >6 weeks.
3. Number of joints affected: monoarthritis,oligo or pauciarthritis ,polyarthritis.
4. pattern of involvement :axial (spine,sacroiliac,anterior chest wall,shoulder and hip joint)or appendicular (peripheral joints).shoulder and hip joints are known as root joints.
5. Distribution of joint involvement: symmetrical or asymmetrical ,small or large joint,lower limbs or upper limbs.involvement of any specific joint(eg., 1st metatarsophalangeal joint in gout,haemarthrosis of knee joint in haemophilia. DIP joints of hands in osteoarthritis).
6. order of sequence of affection : intermittent (gout) or progressive(classical RA),migratory(rheumatic arthritis,SLE,serum sickness) or additive(RA).
7. Extra articular manifestations: constitutional symptoms (eg.,fever),skin rash,subcutaneous nodule,oral ulcer,conjunctivitis or episcleritis,penile ulcer,nail changes (eg,.psoriasis), Raynaud's phenomenon (eg.,scleroderma).

Small and large joint involvement in MSK diseases:

1. Small joint arthropathy : RA.SLE,gout ,nodular osteoarthritis ,psoriasis, enteropathic arthritis, sarcoidosis.
2. Large joint arthropathy : RA, ankylosing spondylitis, rheumatic arthritis,generalized osteoarthritis,psoriatic and enteropathic arthritis.
3. Both large and small joints arthropathy: RA ,SpA, osteoarthritis.
4. Differentiate arthritis according to serology:
5. Seropositive (RF positive)- sjogren's syndrome, RA,SLE, polymyositis – dermatomyositis,systemic sclerosis, vasculitis. The higher the titre of RF ,the more severe is the disease.

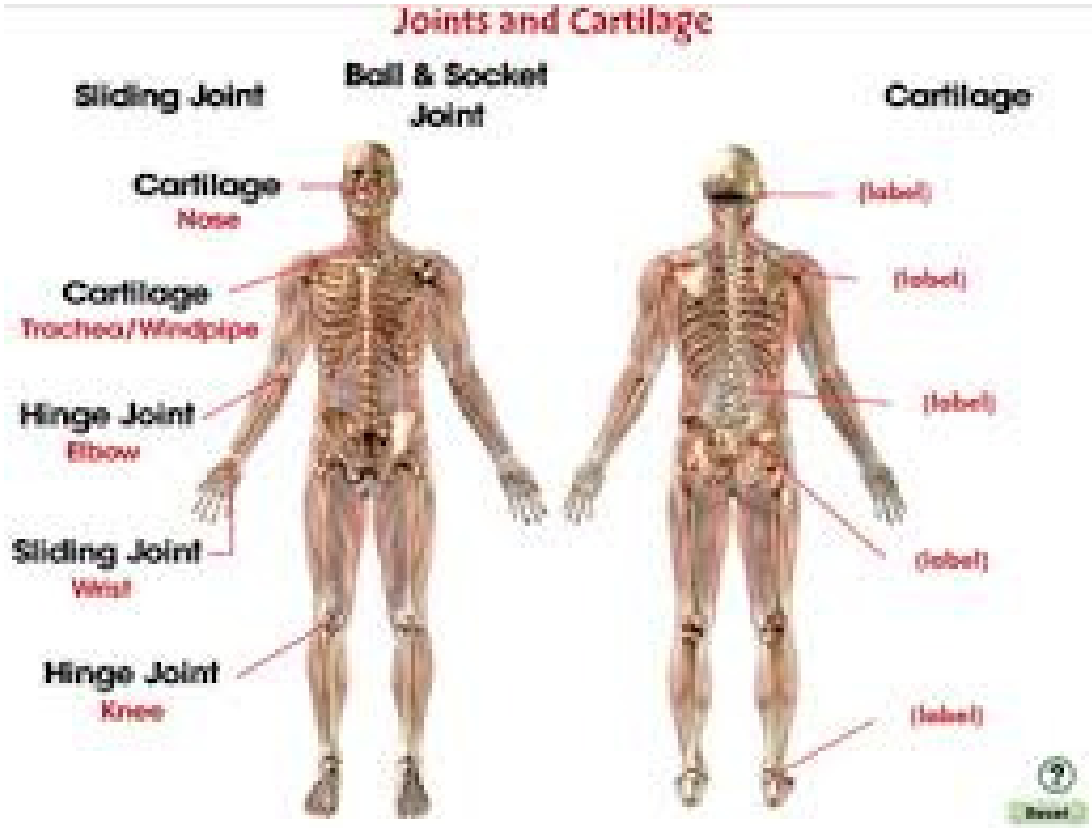
Seronegative (RF negative)- SpA(the whole group), gout, osteoarthritis, juvenile idiopathic arthritis (JIA: majority are RF negative),RA (30%),rheumatic arthritis, still's disease .

RF is also positive in certain non-rheumatic diseases like fibrosing alveolitis,leprosy,tuberculosis,infectious mononucleosis,syphilis,kala-azar,chronic

hepatiis,infective endocarditis,cryglobulinaemia,malignancy,and in normal population (5% women aged above 60 years).

Common imaging modalities done in musculoskeletal disorders:

1. X-ray : to demonstrate fracture ,bony erosion ,osteophytes,ankylosis etc.
2. Ultrasonography : to visualize soft tissue/periarticular structures/ tendon,baker's cyst, rotator cuff tear ,thickened achilies tendon.
3. Radionuclide scintigraphy : 99m Tc-biophosphate, 67- gallium and 111-indium scans are occasionally used to localize infections.
4. CT scan: for sacroliitis ,prolapsed intervertebral disc,trauma to the spine etc.
5. MRI scan: to visualize vessel,nerve,fascia,muscle,cartilage,ligament,synovial effusion,bone marrow oedema, commonly used in spinal cord compression ,prolapsed intervertebral disc,early avascular necrosis etc.
6. Bone mineral density measurement: dual energy X-ray absorptiometry (DEXA) is the current method of choice to diagnosis osteopenia and osteoporosis (T-score and Z-score).


Joints and Cartilage
Sliding Joint
Ball & Socket Joint
Cartilage
Cartilage
Nose
Cartilage
Trachea/Windpipe
Hinge Joint
Elbow
Sliding Joint
Wrist
Hinge Joint
Knee
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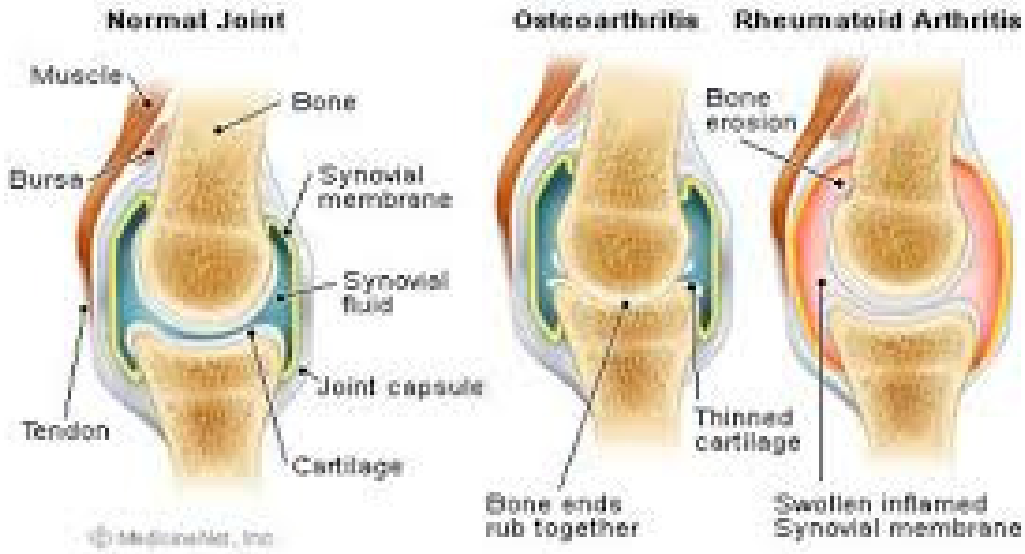
POLYARTHRITIS



Normal and Arthritic Joints

MATERIALS AND METHODS

The Clinical study on Santhuvatham was carried out in the Post graduate Sirappu Maruthuvam department of Govt Siddha Medical College, Palayamkottai. In this study 40 patients (who satisfy the inclusion criteria and exclusion criteria) were treated as OP and IP patients. The clinical trial was duely approved by the Institutional Ethics Committee (IEC), Government Siddha Medical College, Palayamkottai.

SAMPLE SIZE :

40 patients (20 OPD &20 IP- 10 Patients with trial medicines and Varmam, 10 with pottanam along with trial medicines).

INCLUSION CRITERIA:

- Age : between 20- 60 years
- Sex : Both male and female
- Joints pain : more than 5 joints
    - Swelling
    - Stiffness
    - Restricted movements in affected joint.
    - Willing for admission and study in IPD for 40 days or willing to attend OPD

EXCLUSION CRITERIA:

- Rheumatic Fever
- Rheumatoid arthritis
- Other systemic illness
- Gout
- Recent Fracture
- Recent Dislocation of joints
- Malignancy
- Use of narcotic drugs
- Pregnancy and Lactation
- Tuberculosis

WITHDRAWAL CRITERIA:

- ✓ Intolerance to the drug and development of adverse reactions during drug trial.
- ✓ Poor patient's compliance and defaulters.
- ✓ Patient turned unwilling to continue in the course of clinical trial.
- ✓ Occurrence of any serious illness.

TESTS AND ASSESMENTS:

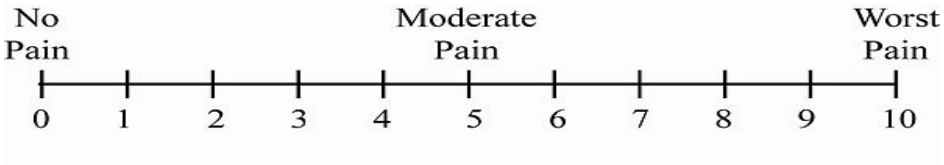
- Clinical assessment
- Routine investigations
- Specific investigation
- Radiological investigations
- Siddha investigations

CLINICAL ASSESSMENT:

- Pain in more than five joints
- Tenderness, Numbness
- Stiffness
- Restriction of movements of affected joints
- Effect of treatment will be evaluated on the basis of changes in the signs and symptoms after the treatment.

PAIN ASSESSMENT

UNIVERSAL PAIN ASSESSMENT SCALE



A.0 : No Pain

B. 1-3 : Mild pain

C.4-6 : Moderate pain

D.7-10 : Severe pain

Reference: Clinical Manual for Nursing Practice. (National Institute of Heatlth Warren Grant Magnuson Clinical center

GRADATION:

Grade 1: Fit for all activities to do their work without support (Normal)

Grade 2: Mild Pain and Mild restriction of Movements

Grade 3: Moderate Pain and Moderate restriction of Movements

Grade 4: Severe Pain and Severe restriction of Movement

Investigations

The symptoms of santhuvatham were more or less correlated with polyarthritic conditions of (Rheumatological and collagen diseases) in modern medicine. So investigations meant for such diseases were done for santhuvathamSome of these are routine blood tests, urine tests, stool examination and specific tests such as rheumatoid arthritis factor, radiographic evaluation etc. Besides this blood sugar, blood urea, serum cholesterol were also investigatedThe diagnosis was made by following Siddha diagnostic methods. Nilam, Kalam, Poriyalaridhal, Pulanalarithal, Vinaadhal, Mukkutra Nilaigal , UdalThathukalNilai and EnvagaiThervugal, and the diagnosis of Santhuvatham were obtained which correlated with modern diagnosis of Polyarthritis by the XRay findings.

INVESTIGATION:

The following investigations were done in all selected patients in the laboratory of Government Siddha Medical College, Palayamkottai.

BLOOD:

TC (Cells/cumm)

DC P L E M N

ESR ½ hr 1hr

Hb g%

Blood Sugar:

Fasting

Post prandial

Renal function tests:

Blood urea

Blood uric acid

Serum creatinine

Serology:

C-reactive protein

RA factor

ASO titre

Urine examination:

Albumin

Sugar

Deposits.

RADIOLOGICAL INVESTIGATIONS: ,

X-Ray of affected jonts(AP and Lateral view).

TREATMENT :

“விரேசனத்தால் வாதந் தாழும்”

Vellaiennai 15ml at morning with hot water was given on the first day of treatment.

INTERNAL;

Drug:santhuvatha chooranam

REFERENCE:

Athmarakshamirtham,pageno-312DOSE: 800-1000 mg Three times per day

ADJUVANT:

Hot water

DURATION:

48 days.

EXTERNALDRUG:

Vatha Ennai

REFERENCE:

Agasthiyar vaithiya soothiram-650,page no-280,281

POTTANAM

DRUG:

snegha pottana

REFERENCE:

Sarabendirara vaithiya muraigal-vatha roga sigichai.

RESULTS AND OBSERVATION

For the clinical study 40 patients were selected and treated in PG-III Sirappu Maruthuvam Department, GSMC hospital, Palayamkottai. Results were observed with respect to the following criteria.

1. Gender distribution
2. Age distribution
3. Kalam
4. Paruvakalam
5. Gunam
6. Thinai
7. Socioeconomic factors
8. Etiological factors
9. Occupation
10. Disturbance in vatha
11. Disturbance in pitha
12. Disturbance in kapha
13. Udal thathukkal
14. Envagai thervu
15. Naadi
16. Neikuri
17. Distribution of illness
18. Clinical manifestation
19. Systemic manifestation
20. Locomotor system
21. Internal and external medicines
22. a.Effect of Trial drug

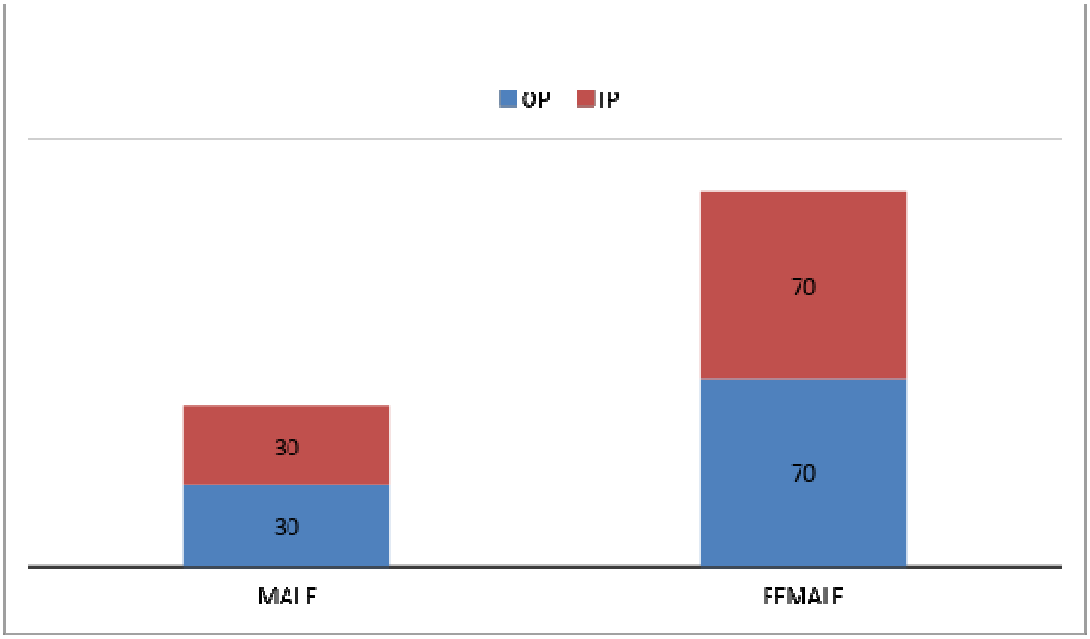
    b.Effect of pottanam

    c.Effect of varmam
23. Effect of Trial drug along with complementary therapies
24. Comparison between effective of trial drug and trial drug with complementary therapies
25. Comparison between effective of trial drug and trial drug with pottanum and trial drug with varmam.
26. Effect of theraphy.

Table 1

GENDER DISTRIBUTION

S.NO	GENDER	OP		IP	
		NO OF CASES	PERCENTAGE %	NO OF CASES	PERCENTAGE
1	MALE	6	30	6	30
2	FEMALE	14	70	14	70



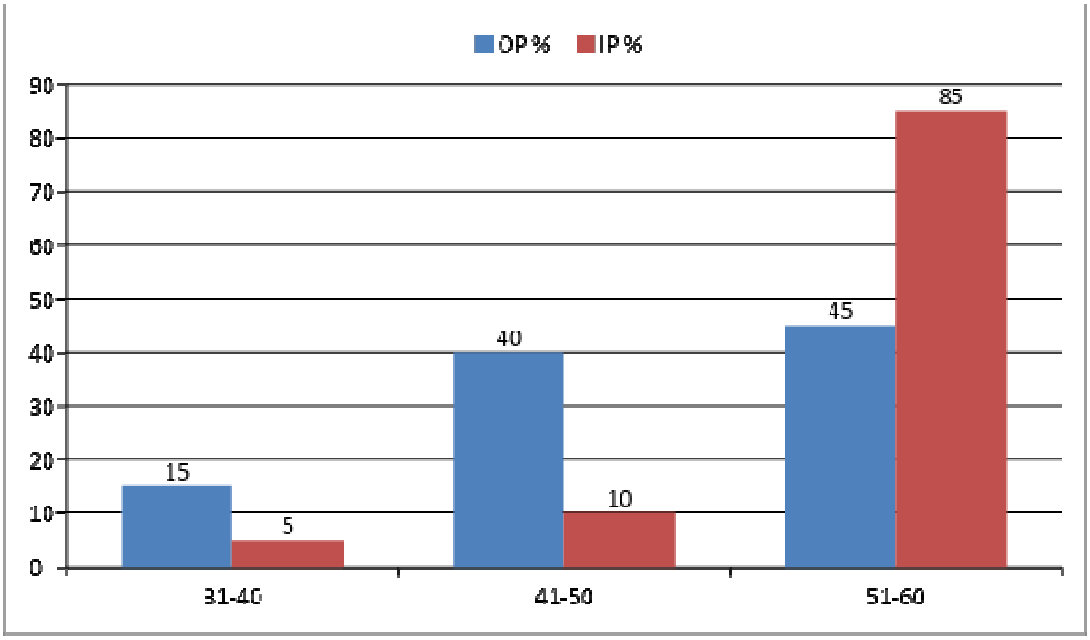
Inference

- Out of 20 out patients 30% were male 70% were female
- Out of 20 inpatients 30% were male and 70% were female.

Table 2

AGE DISTRIBUTION

S.NO.		OUT PATIENTS		INPATIENTS	
		NO OF OPCA SES	PERCENT AGE	NO OF IPCA SES	PERCENT AGE
1	31-40	3	15	1	5
2	41-50	8	40	2	10
3	51-60	9	45	17	85



Inference

Among 20 out patients

15% of cases were observed in the age group 31-40 years

40% of cases were observed in the age group 41-50 years

45% of cases were observed in the age group 51-60 years

Among 20 In patients

5% of cases were observed in the age group 31-40 years

10% of cases were observed in the age group 41-50 years

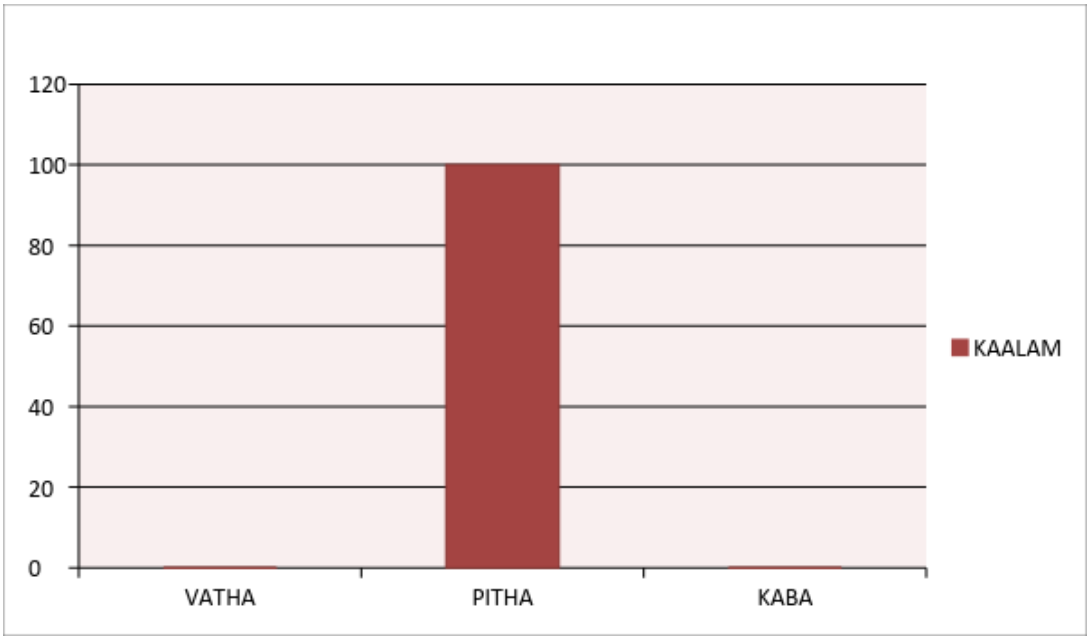
85% of cases were observed in the age group 51-60 years

Table 3

Table 3

KAALAM (LIFE SPAN)

S.NO.	KAALAM	NO OF CASES	PERCENTAGE
1	VATHA KALAM(upto 33 years)	0	0
2	PITHA KALAM(34-66 years)	40	100
3	KABA KALAM (above 67 years)	0	0



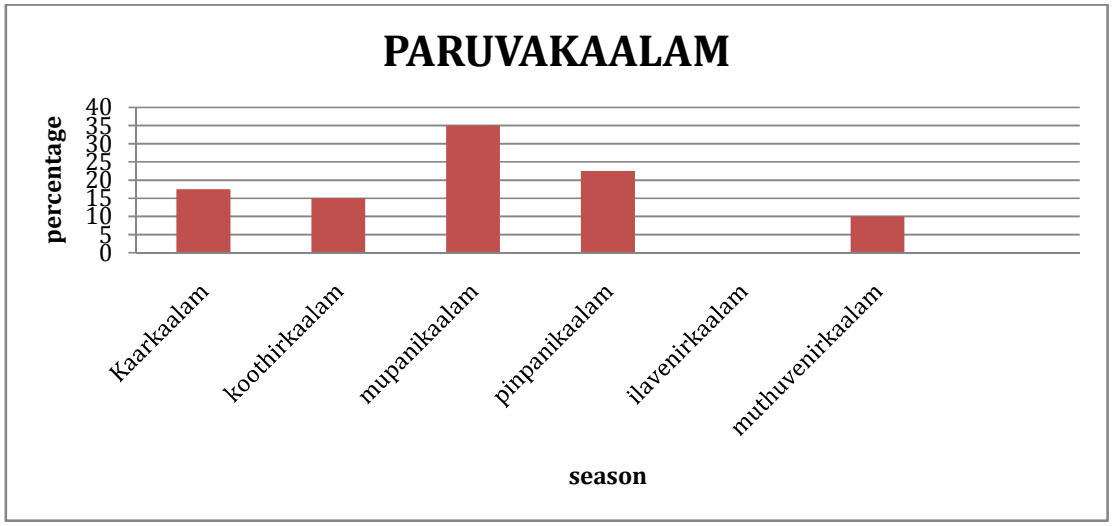
Inference

Out of 40 patients100% of cases were in the Pithakaalam

Table 4

PARUVAKAALAM

S.NO.	SEASON	NO OF CASES	PERCENTAGE %
1	Kaarkaalam - Aavani, Purattasi (15 Aug - 14 Oct)	7	17.5
2	Koothirkaalam - Iyppasi, Karthigai (15 Oct - 14 Dec)	6	15
3	Mupanikaalam - Markazhi, thai (15 Dec – 14 Feb)	14	35
4	Pinpani kaalam – Masi, Panguni (15 Feb – 14 Apr)	9	22.5
5	Ilavenirkaalam - Chithirai, vaikasi (15 Apr – 14 June)	0	0
6	Muthuvenirkaalam-aani ,aadi (15 June-14 Aug)	4	10



Inference

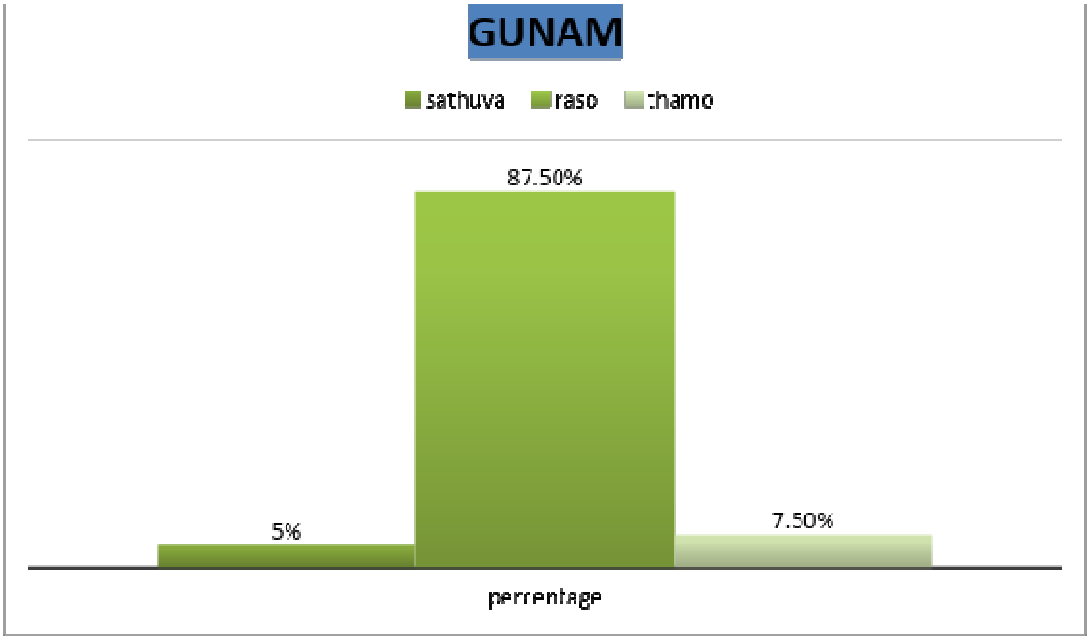
Among 40 cases,

- 17.5% of patients were admitted in kaarkalam
- 15% of patients were admitted in koothirkaalam
- 35% of patients were admitted in Munpanikalam
- 22.5% of cases were admitted in pinpanikalam
- 10% were admitted in muthuvenirkaalam

Table 5

GUNAM

S.NO.	GUNAM	NO OF CASES	PERCENTAGE %
1	SATHUVA	2	5
2	RASO	35	87.5
3	THAMO	3	7.5



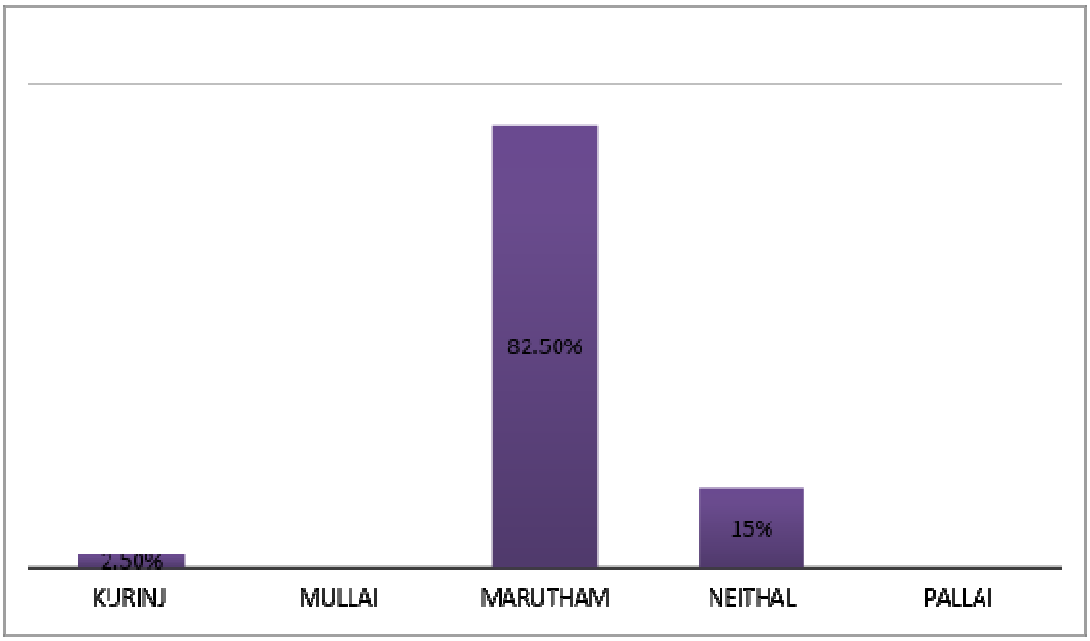
Inference

- About 5% of the patients had Sathuva gunam
- 87.5% of the patients had Rasogunam
- 7.5% of the patients had Thamogunam

Table 6

THINAI

S.NO.	THINAI	NO OF CASES	PERCENTAGE
1	KURINJI	1	2.5
2	MULLAI	0	0
3	MARUTHAM	33	82.5
4	NEITHAL	6	15
5	PALAI	0	0



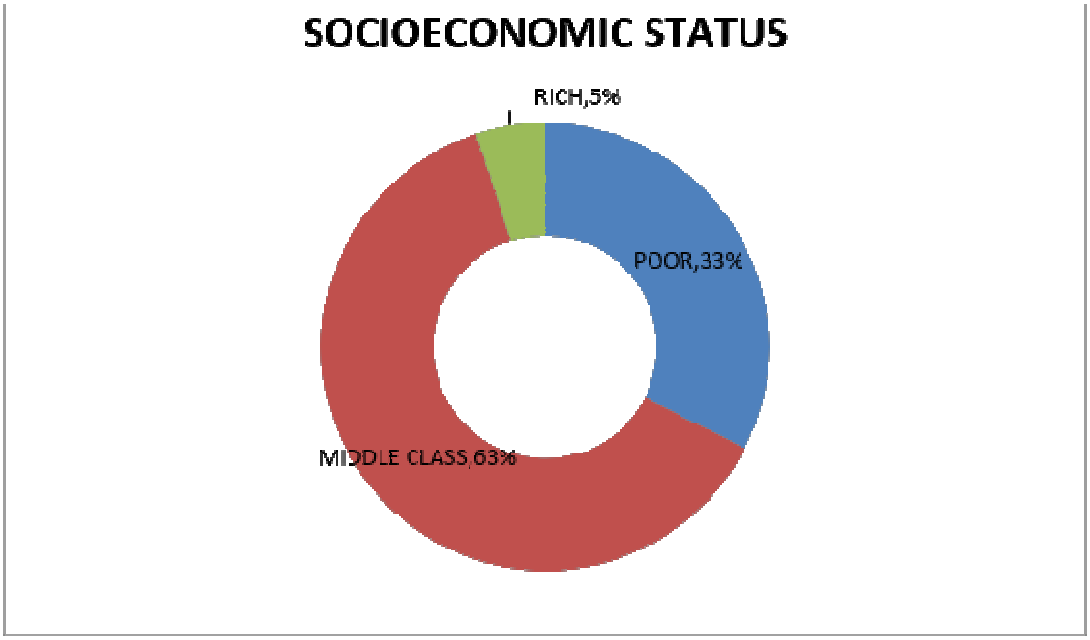
Inference

About 82.5% of the patients were from marutham, 2.5% were from kurinji, 15% were from Neithal.

Table 7

SOCIO ECONOMIC STATUS

S.NO	SOCIO ECONOMIC STATUS	NO OF CASES	PERCENTAGE
1	POOR	13	32.5 %
2	MIDDLE CLASS	25	62.5%
3	RICH	2	5 %



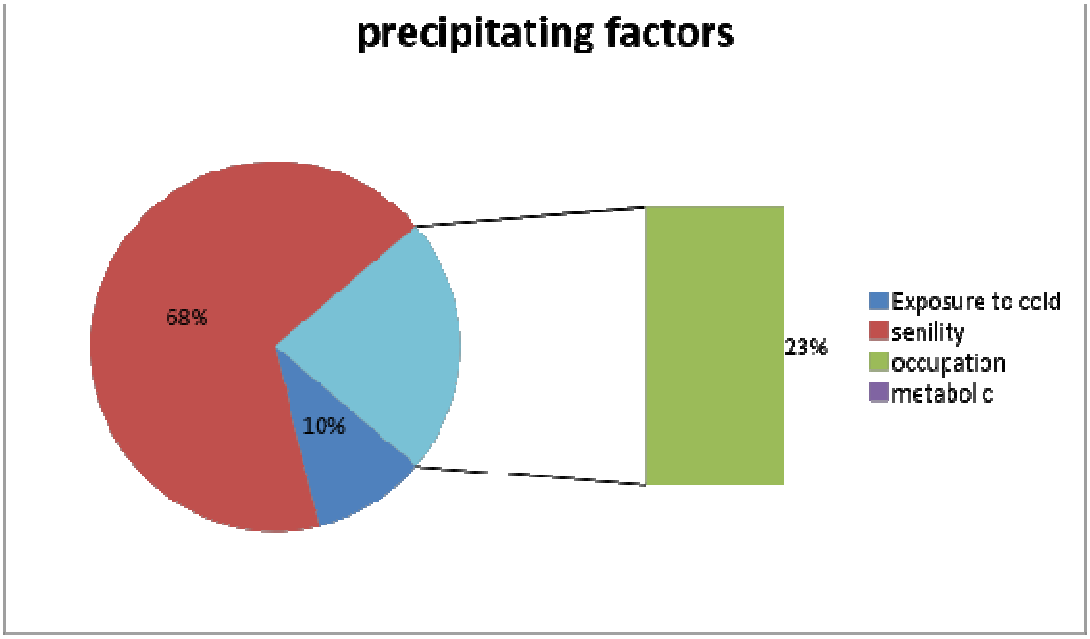
Inference

The above study consists of 62.5% of cases from middle class, 32% of cases from poor and 5% of rich.

Table 8

DISTRIBUTION BASED ON ETIOLOGICAL FACTORS

S.NO.	PRECIPITATING FACTORS	NO OF CASES	PERCENTAGE %
1	Exposure to cold	4	10%
2	Senility	27	67.5%
3	occupation	9	22.5%
4	metabolic	0	0



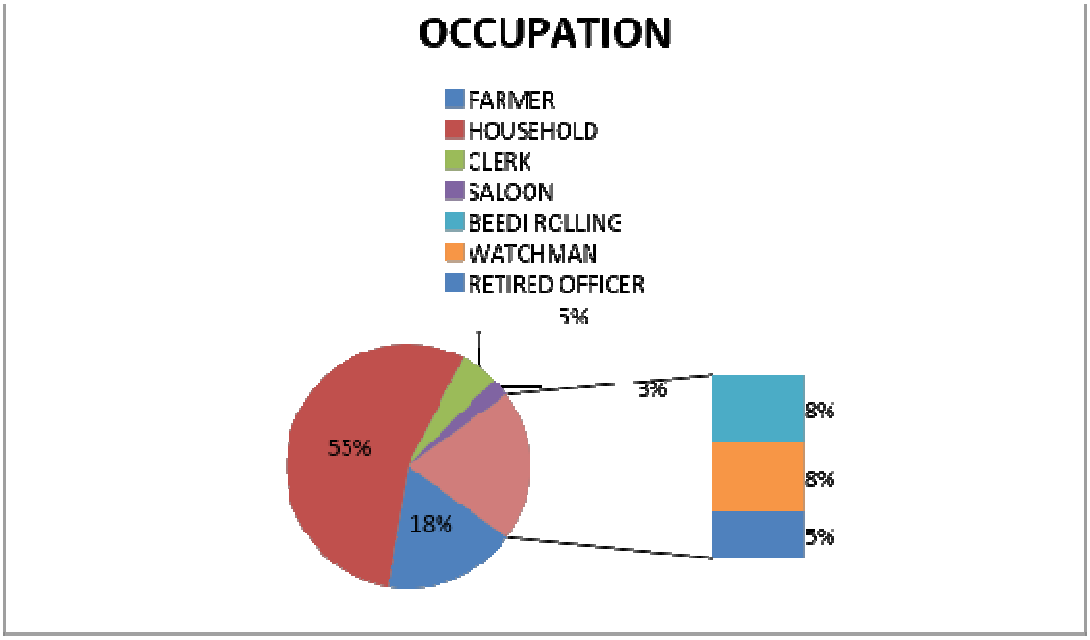
Inference

It was noted while taking the history of the patients Santhuvatham was caused mainly 67% due to the senility. The remaining were due to other factors like occupation and exposure to cold.

Table 9

OCCUPATIONAL STATUS

S.NO	OCCUPATION	NO OF CASES	PERCENTAGE %
1	Farmer	7	17.5%
2	Household	22	55%
3	Clerk	2	5 %
4	Saloon	1	2.5 %
5	Beedi rolling	3	7.5 %
6	Watchmen	3	7.5 %
7	Retired officer	2	5 %



Inference

55% has been household

17.5% has been farmer

7.5% has been beedi rolling and watchman

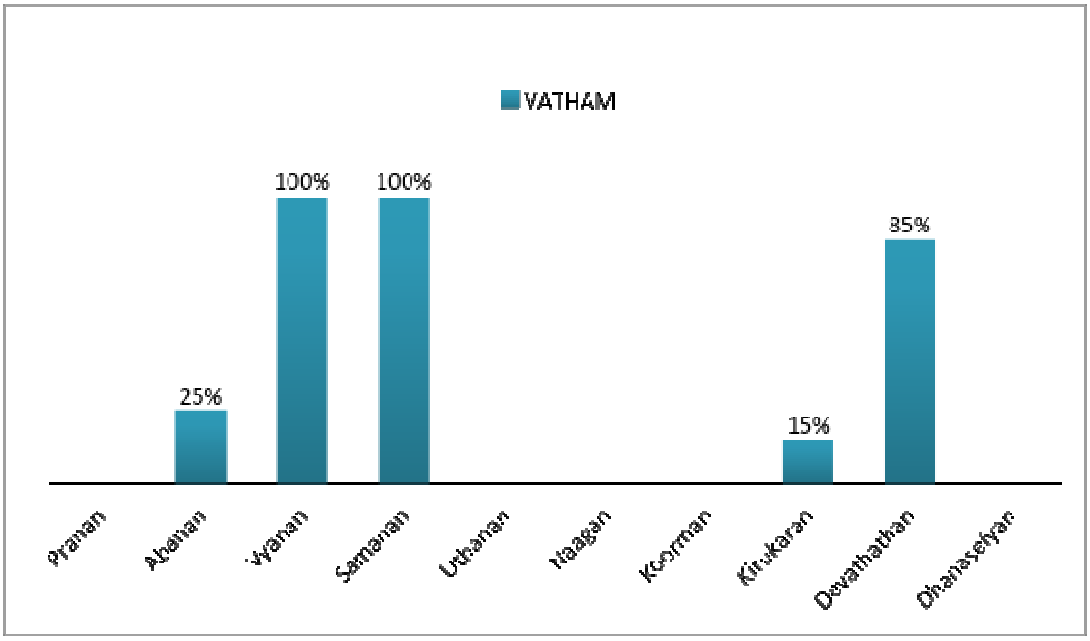
5% has been clerk and retired officer

2.5% has been saloon

Table 10

DISTURBANCES IN VATHAM

S.NO	VATHAM	NO OF CASES	PERCENTAGE
1	PRANAN	0	0
2	ABANAN	10	25%
3	VYANAN	40	100 %
4	SAMANAN	40	100 %
5	UTHANAN	0	0
6	NAAGAN	0	0
7	KOORMAN	0	0
8	KIRUKARAN	6	15 %
9	DEVATHATHAN	34	85%
10	DHANASEIYAN	0	0



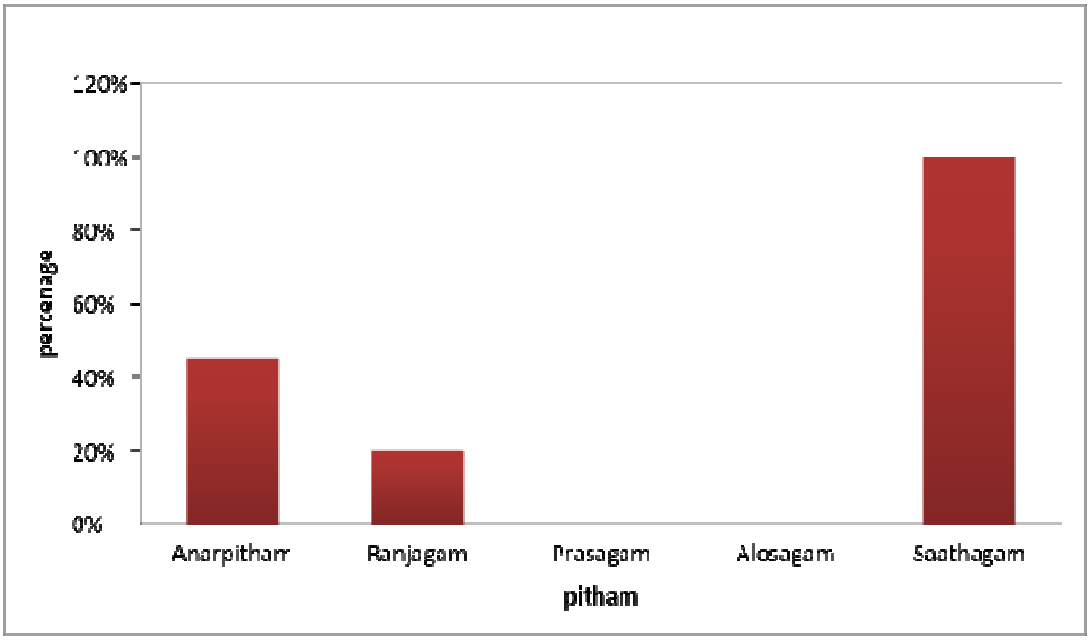
Inference

100% has viyanan(restricted movement of affected joints and radiating pain), samanan affected(due to vyanan affected), 25% abanan affected(constipation), 85% has devathathan affected(sleeplessness),15 % kirukaran has affected(cold).

Table: 11

DISTURBANCES IN PITHAM

S.NO	PITHAM	NO OF CASES	PERCENTAGE%
1	Anarpitham	18	45%
2	Ranjagam	8	20%
3	Prasagam	0	0
4	Alosagam	0	0
5	Saathagam	40	100 %



Inference

100%saathagam pitham has affected(pain and restricted movement).

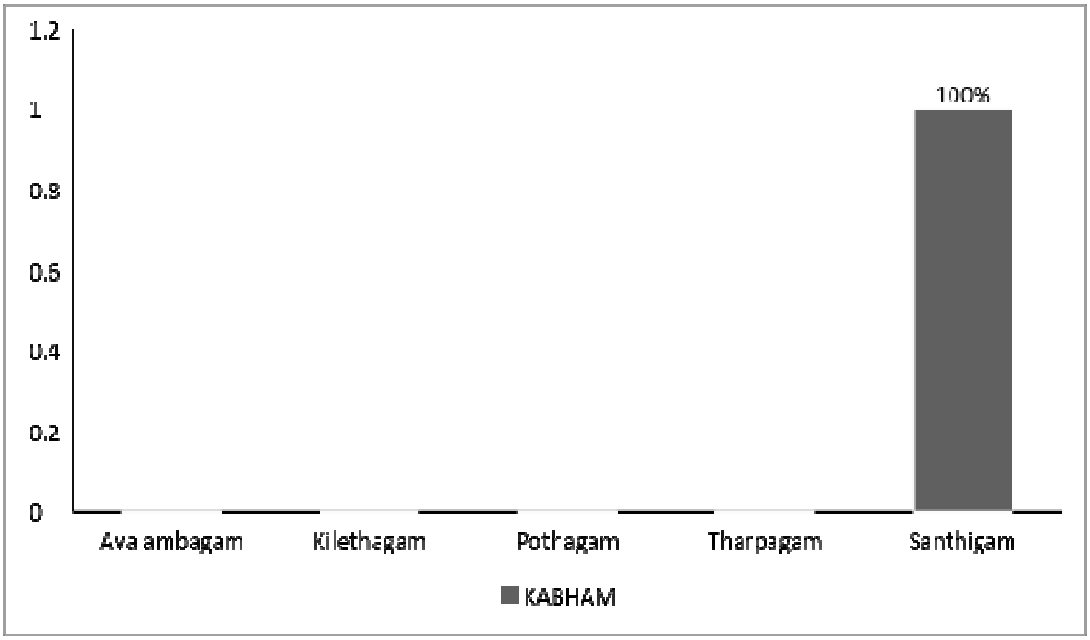
45% Anarpitham pitham has affected(loss of appetite).

20% ranjagam pitham has affected(Hb level decreased).

Table 12

DISTURBANCES IN KABHAM

S.NO	KABHAM	NO OF CASES	PERCENTAGE%
1	Avalambagam	0	0
2	Kilethagam	0	0
3	Pothagam	0	0
4	Tharpagam	0	0
5	Santhigam	40	100 %



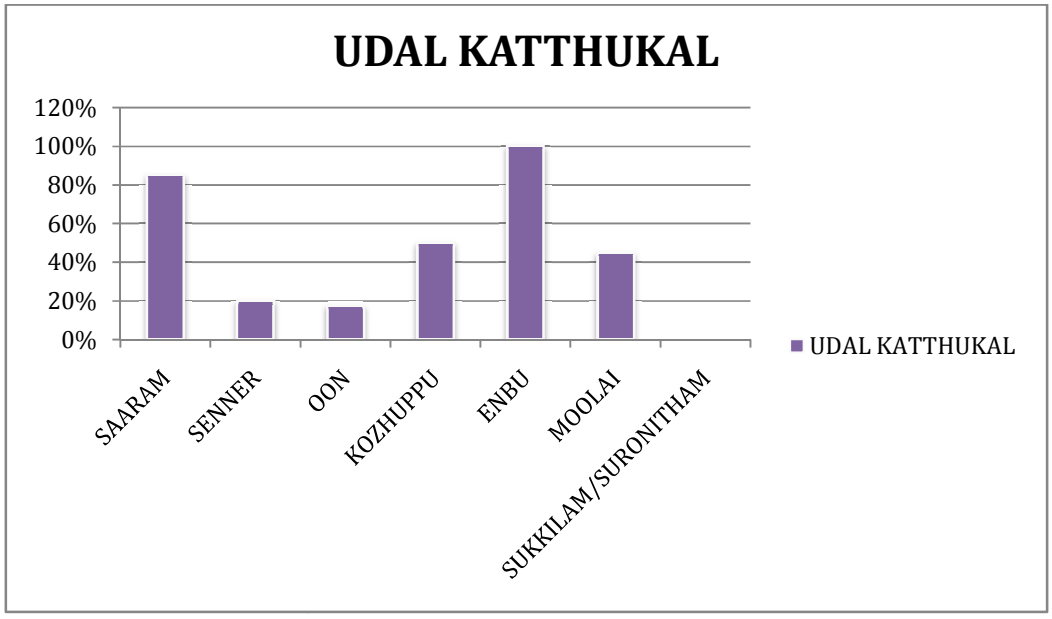
Inference

100% Santhigam has affected (pain and restricted movement).

Table 13

CONDITIONS OF UDAL KATTUKAL

S.NO.	UDAL KATTUKAL	NO OF CASES	PERCENTAGE%
1	Saaram	34	85%
2	Senner	8	20%
3	Oon	7	17.5%
4	Kozhuppu	20	50%
5	Enbu	40	100%
6	Moolai	18	45%
7	Sukkilam/Suronitham	0	0



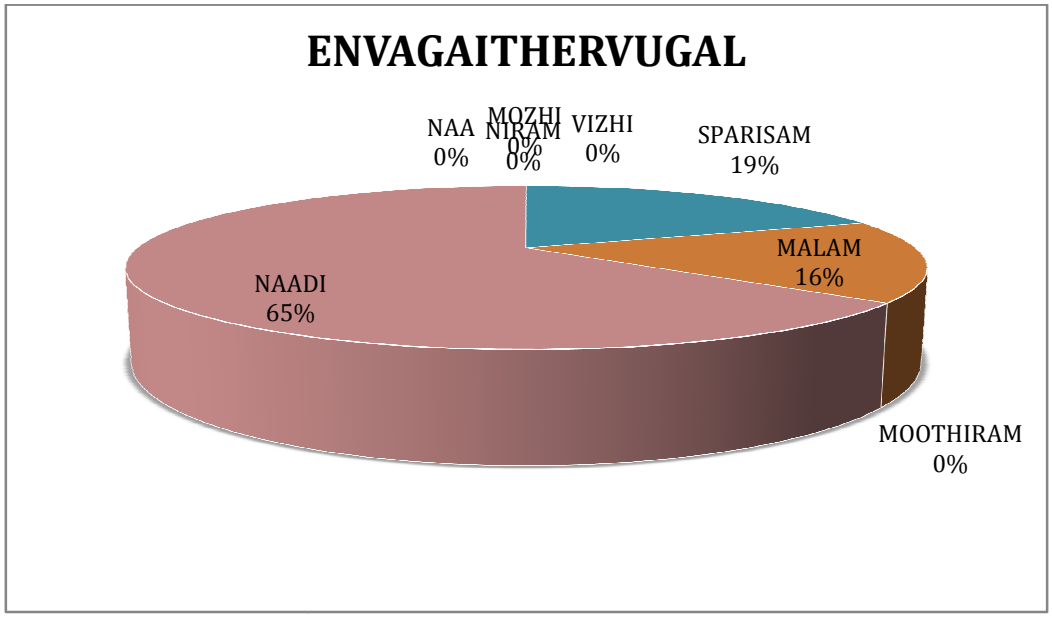
Inference

In 7 udal kattukal , 100% was enbu affected(restricted in joint movement),85% was saaram affected (loss of strength to body),50% was kozhuppu was affected(movement restriction),45% was moolai affected,20% senner was affected(low energy),17.5% was oon affected(later stage).

Table 14

CONDITION OF ENVAGAITHERVUGAL

S.No.	Envagai thervugal	Number of cases	Percentage%
1.	Naa	0	0
2.	Niram	0	0
3.	Mozhi	0	0
4.	Vizhi	0	0
5.	Sparisam	12	30%
6.	Malam	10	25%
7.	Moothiram	0	0
8.	Naadi	40	100%



Inference

100% seen in naadi (patient had thontha naadi)

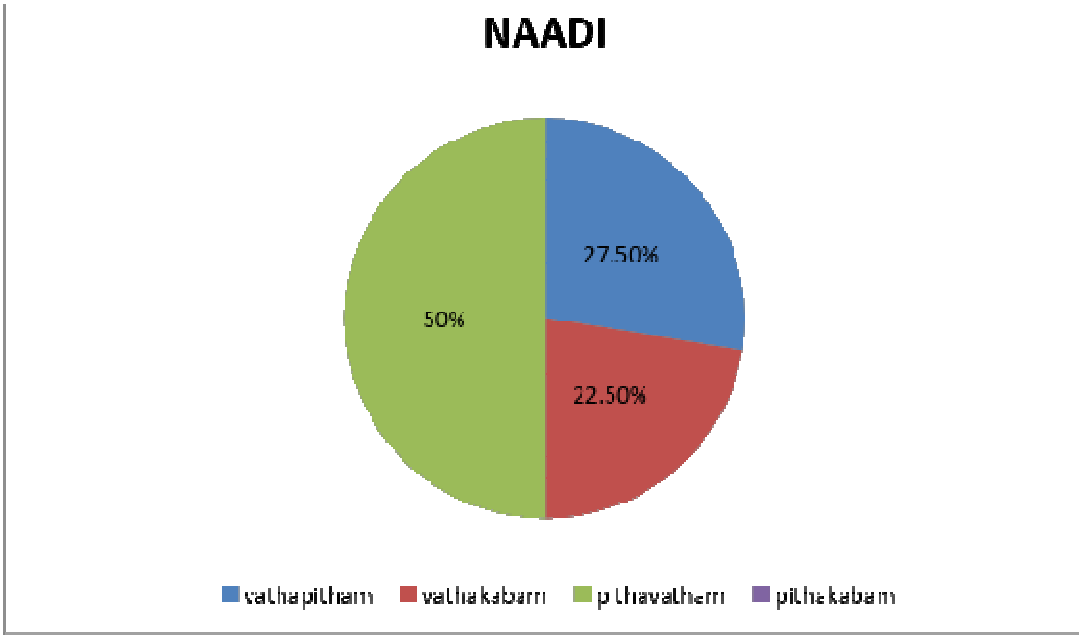
30% seen in sparisam.

25% seen in malam(constipation).

Table 15

ILLUSTRATION OF NAADI

S.No.	Parameters	Number of cases	Percentage
1.	Vathapitham	11	27.5
2.	Vatha kabam	9	22.5
3.	Pitha vatham	20	50
4.	Pitha kabam	0	0



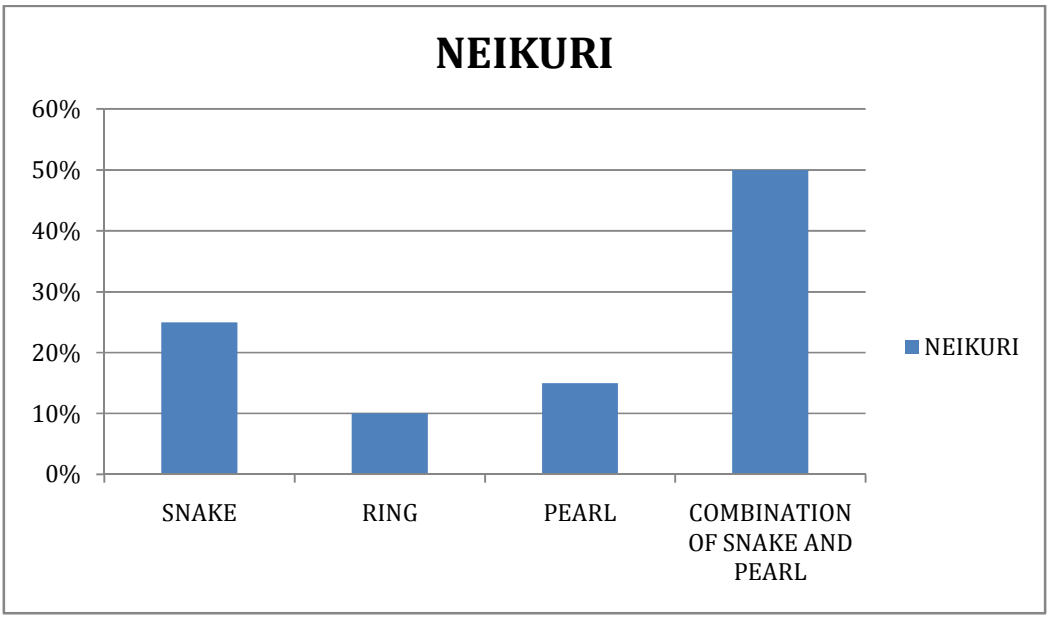
Inference

As mentioned above thontha naadi was noted in all cases and among them 50% were pitha vatha nadi, 22.5% were vathakabha nadi and remaining 27.5% were vathapitha nadi.

Table 16

NEIKURI

S.NO	SPREADING PATTERNS	NO OF CASES	PERCENTAGE %
1	Snake	10	25
2	Ring	4	10
3	Pearl	6	15
4	Combination of snake and pearl	20	50



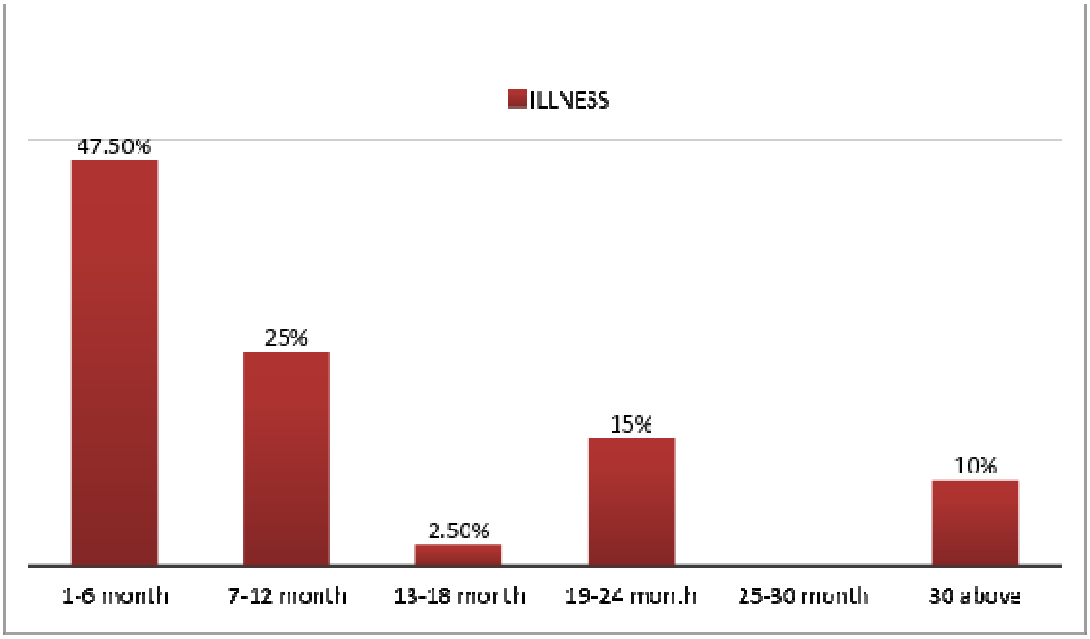
Inference

In neikuri analysis, 50% of the cases presented with pithakabha neer, 25% with vatha neer, 15% with kaba neer and the remaining 10% presented pitha neer.

Table 17

DURATION OF ILLNESS

S.No.	Duration of illness (Months)	Number of cases	Percentage (%)
1.	1- 6	19	47.5
2.	7 – 12	10	25
3.	13 – 18	1	2.5
4.	19-24	6	15
5.	25-30	0	0
6.	30 Above	4	10



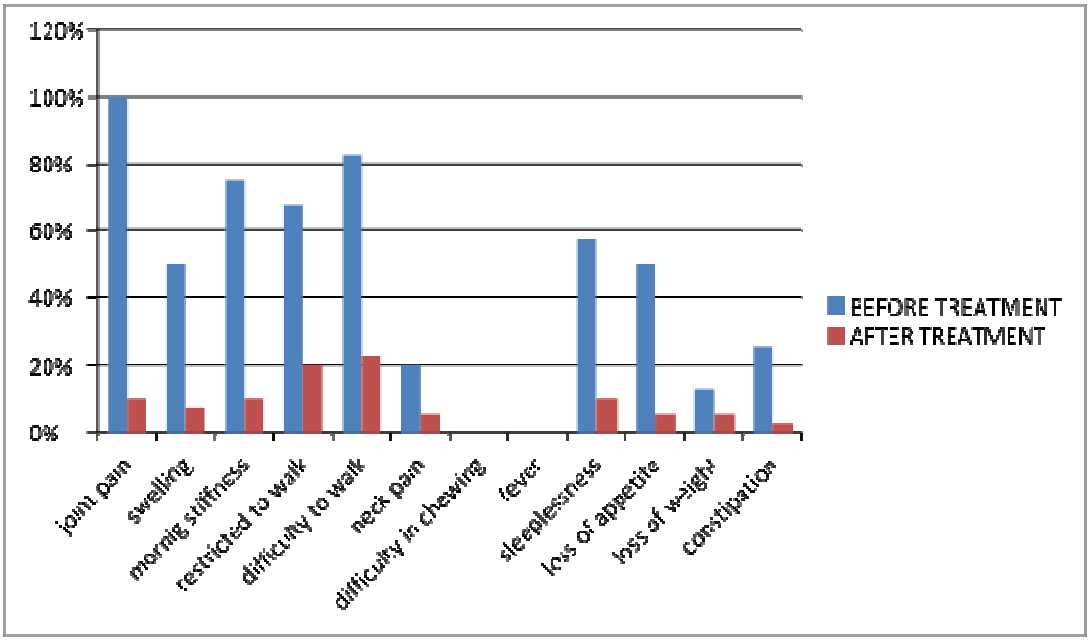
Inference

In duration of illness, 47.5% occur upto 6 months, 25% occur in 7-12 months, 2.5% occur in 13-18 months, 15% occur in19-24 months, 10% occur in Above 30 months.

Table 18

CLINICAL MANIFESTATIONS

S.NO	SYMPTOMS	BEFORE TREATMENT		AFTER TREATMENT	
		NO OF CASES%	PERCENTAGE%	NO OF CASES	PERCENTAGE%
1.	Joint pain	40	100	4	10
2.	Swelling	20	50	3	7.5
3.	Morning stiffness	30	75	4	10
4.	Restricted to walk	27	67.5	8	20
5.	Difficulty to walk	33	82.5	9	22.5
6.	Neck pain	8	20	2	5
7.	Difficulty in chewing	0	0	0	0
8.	Fever	0	0	0	0
9.	Sleeplessness	23	57.5	4	10
10.	Loss of appetite	20	50	2	5
11.	Loss of weight	5	12.5	2	5
12.	Constipation	10	25	1	2.5
13.	Easy fatiguability	34	85	8	20



Inference

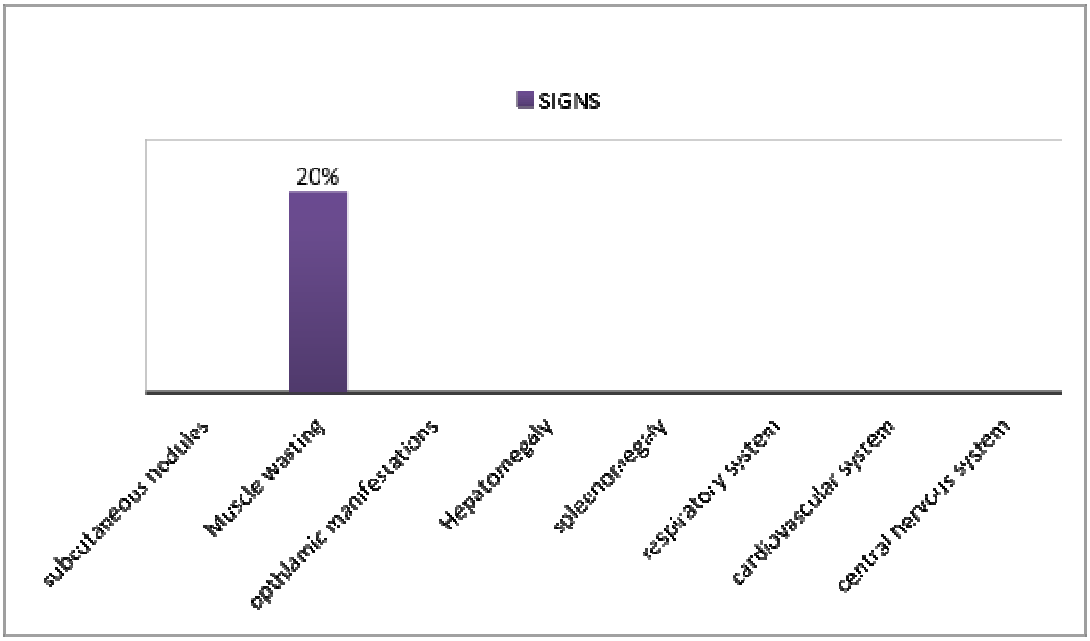
Before treatment 100% of cases had pain, 82.5% of cases has difficulty to walk, 75% of cases had morning stiffness, 67.5% if cases had restricted to walk, 57.5% of cases had sleeplessness, 12.5% has loss of weight ,50% of cases had swelling and loss of appetite, 85% of cases had easy fatiguability and 25% has constipation.

After treatment 10% of cases had pain, morning stiffness, sleeplessness. 20% of cases had easy fatiguability, restricted to walk, 22.5% of cases had difficulty to walk. 7.5% cases had swelling, 5% of cases had loss of appetite,loss of weight and neck pain, 2.5% of cases had constipation.

Table 19

SYSTEMIC MANIFESTATIONS

S.NO	SIGNS	NO OF CASES	PERCENTAGE%
1	Subcutaneous nodules	0	0
2	Muscle wasting	4	20
3	Opthalmic manifestations	0	0
4	Hepatomegaly	0	0
5	Spleenomegaly	0	0
6	Respiratory system	0	0
7	Cardiovascular system	0	0
8	Centralnervous system	0	0



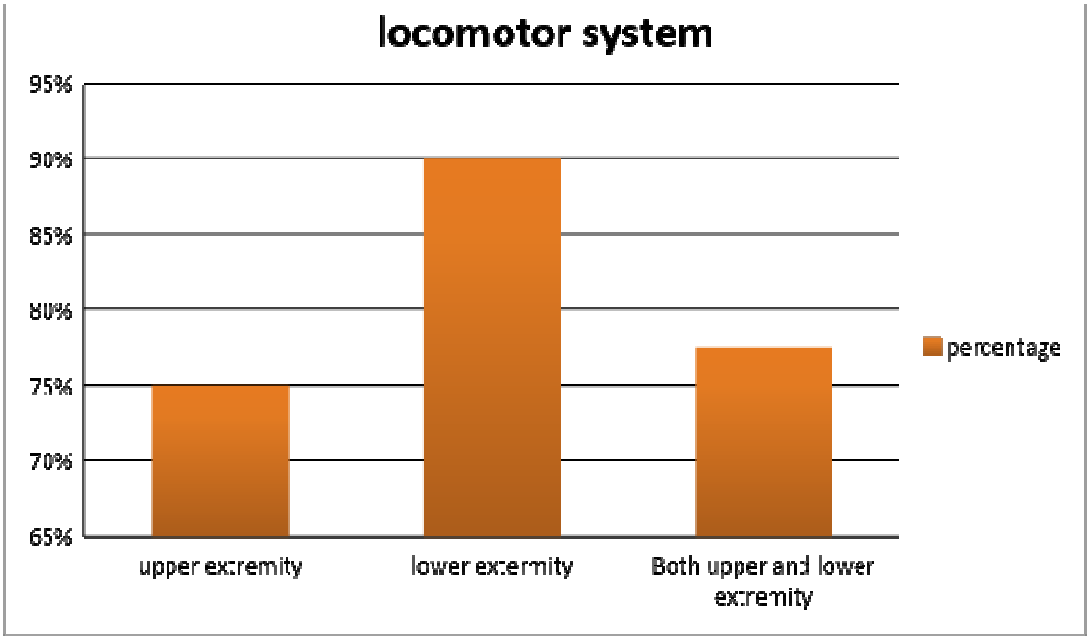
Inference

20% cases show muscle wasting

Table 20.

A.LOCOMOTOR SYSTEM

S.NO	INVOLVEMENT OF UPPER AND LOWER EXTREMITIES	NO OF CASES	PERCENTAGE %
1	Upper extremity	30	75
2	Lower extremity	36	90
3	Both upper and lower extremity	31	77.5

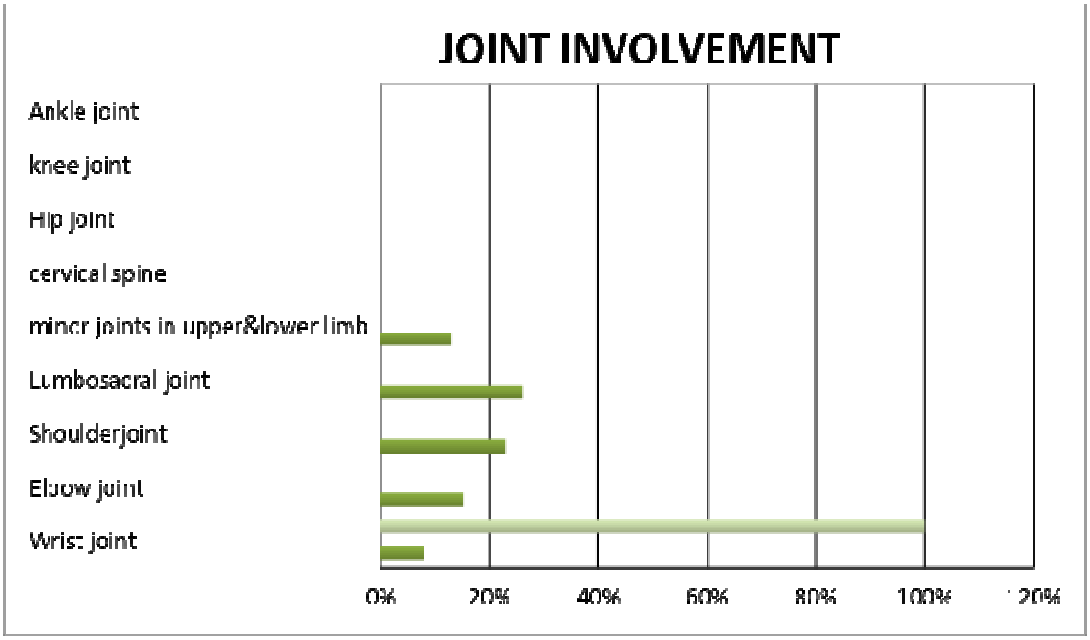


Inference

90% cases show lower extremity, 75% cases show upper extremity and 77.5% cases show both

20. B. INCIDENCE OF INDIVUDUAL JOINT INVOLVEMENT.

S.NO	JOINT INVOLEMENT	NO OF CASES	PERCENTAGE %
1.	Wrist joint	8	20
2.	Elbow joint	12	30
3.	Shoulder joint	23	57.5
4.	Lumbosacral joint	26	65
5.	Minor joints in upper &lower limb	13	32.5
6.	Cervical spine	14	35
7.	Hip joint	11	27.5
8.	Knee joint	36	90
9.	Ankle joint	12	30



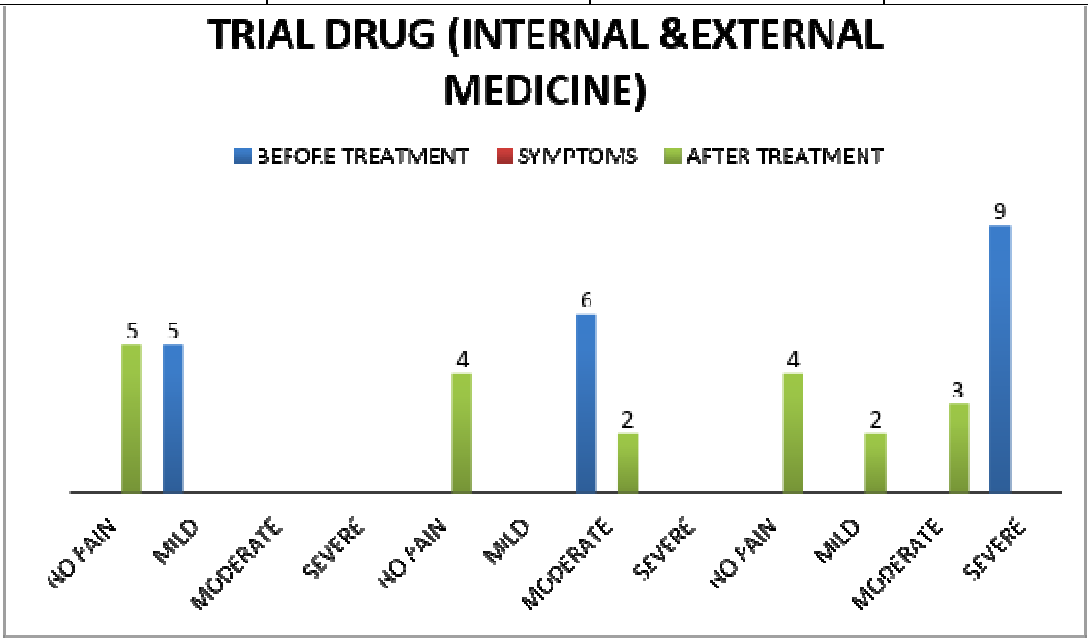
Inference

100% cases show pain in knee joint 26% cases show pain in lumbo sacral joint, 11% cases show pain in hip joint an ankle joint, 23% cases show pain in shoulder , 8% cases show pain inwrist joints, 15% cases show pain in elbow joint, 14% cases show pain in cervical spine.13% case show pain in minor joints in upper and lower limb.

Table 21

ASSESSMENT OF CURATIVE EFFECTS IN PATIENTS TREATED ONLY WITH TRIAL DRUGS (INTERNAL AND EXTERNAL MEDICINES)

S.NO	BEFORE TREATMENT		AFTER TREATMENT	
	SYMPTOMS	NO OF CASES	SYMPTOMS	NO OF CASES
1.	Mild	5	No pain	5
			Mild	0
			Moderate	0
			Severe	0
2.	Moderate	6	No pain	4
			Mild	0
			Moderate	2
			Severe	0
3.	Severe	9	No pain	4
			Mild	2
			Moderate	3
			Severe	0



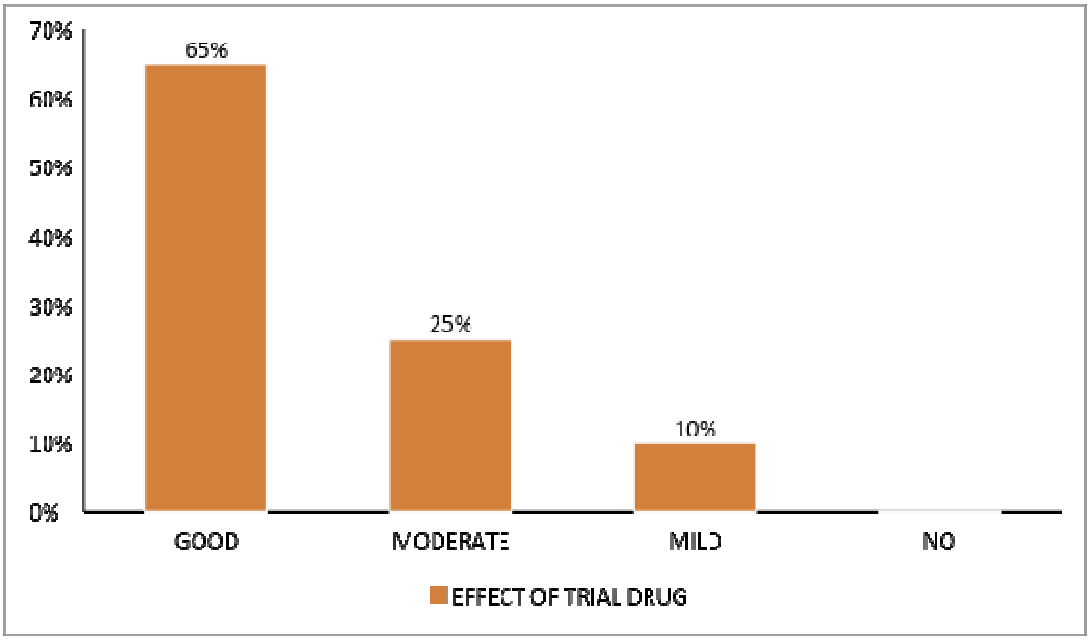
Inference

From the above study, it was inferred that severe pain that was noted in patients before treatment had a remarkable decline after treatment similarly moderate and mild pain were also observed to have decreased after treatment.

Table 22

A.EFFECT OF TRIAL DRUG ALONE

S.NO	EFFECT OF TRIAL DRUG	NO OF CASES	PERCENTAGE
1.	Good	13	65
2.	Moderate	5	25
3.	Mild	2	10
4.	No	0	0

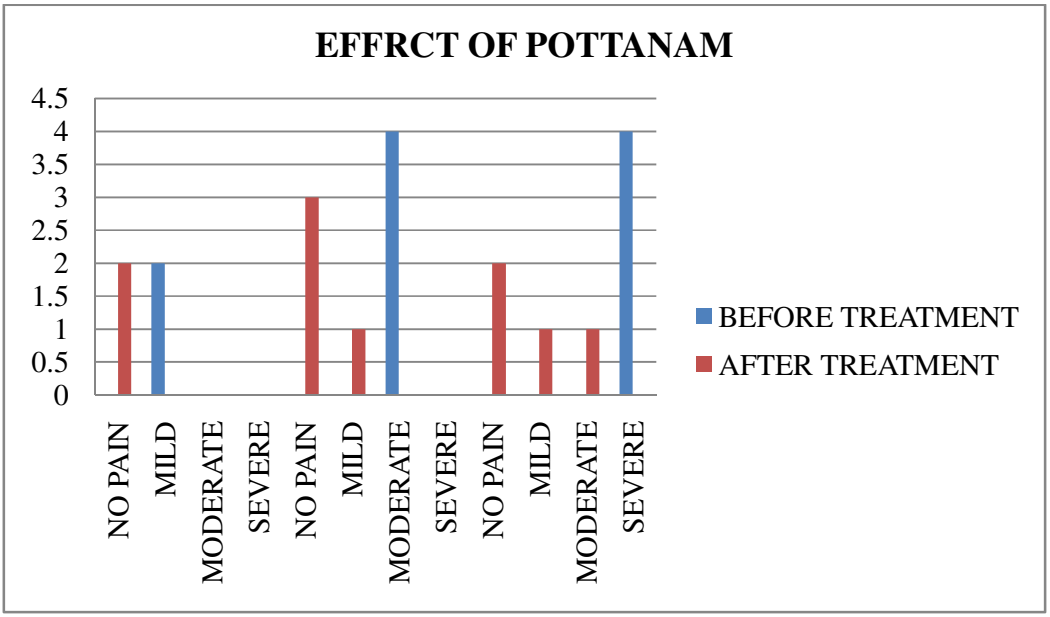


Inference

Administration of trial drug alone had a 65% with good response, 25% with moderate and 10% with mild response.

B.ASSESSMENT OF CURATIVE EFFECTS IN SANTHU VATHAM PATIENTS TREATED WITH TRIAL DRUG ALONG WITH COMPLEMENTARY THERAPY (POTTANAM)

S.NO	BEFORE TREATMENT		AFTER TREATMENT	
	SYMPTOMS	NO OF CASES	SYMPTOMS	NO OF CASES
1.	Mild	2	No pain	2
			Mild	0
			Moderate	0
			Severe	0
2.	Moderate	4	No pain	3
			Mild	1
			Moderate	0
			Severe	0
3.	Severe	4	No pain	2
			Mild	1
			Moderate	1
			Severe	0

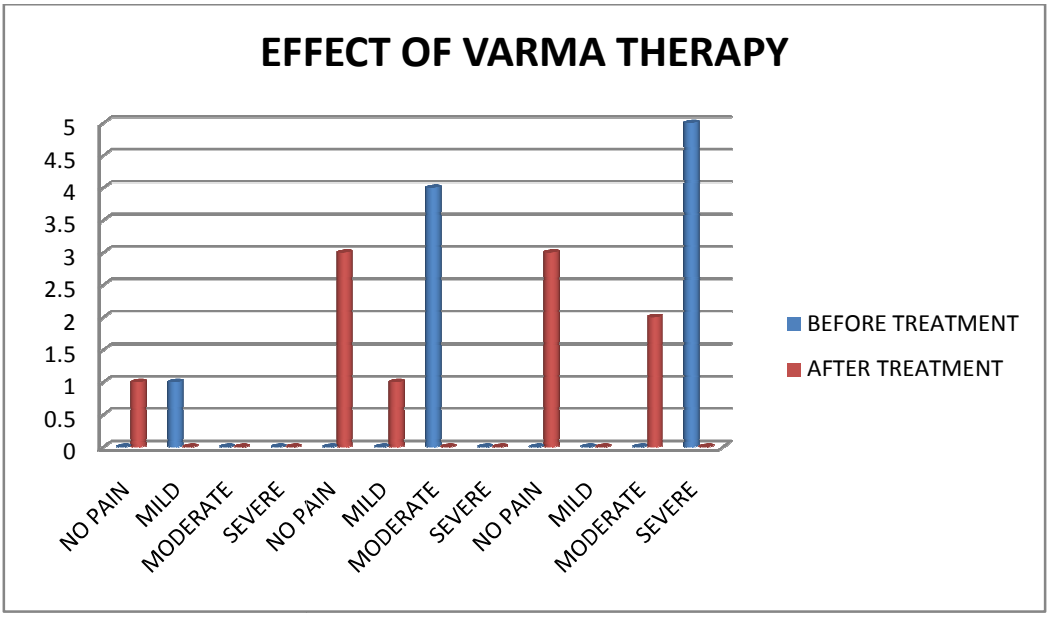


Inference

Administration of trial drug along with complementary therapy reduced severe pain almost all the cases also in mild and moderate cases were notably reduced.

C. ASSESSMENT OF CURATIVE EFFECTS IN SANTHU VATHAM PATIENTS TREATED WITH TRIAL DRUG ALONG WITH COMPLEMENTARY THERAPY (VARMAM)

S.NO	BEFORE TREATMENT		AFTER TREATMENT	
	SYMPTOMS	NO OF CASES	SYMPTOMS	NO OF CASES
1.	Mild	1	No pain	1
			Mild	0
			Moderate	0
			Severe	0
2.	Moderate	4	No pain	3
			Mild	1
			Moderate	0
			Severe	0
3.	Severe	5	No pain	3
			Mild	0
			Moderate	2
			Severe	0



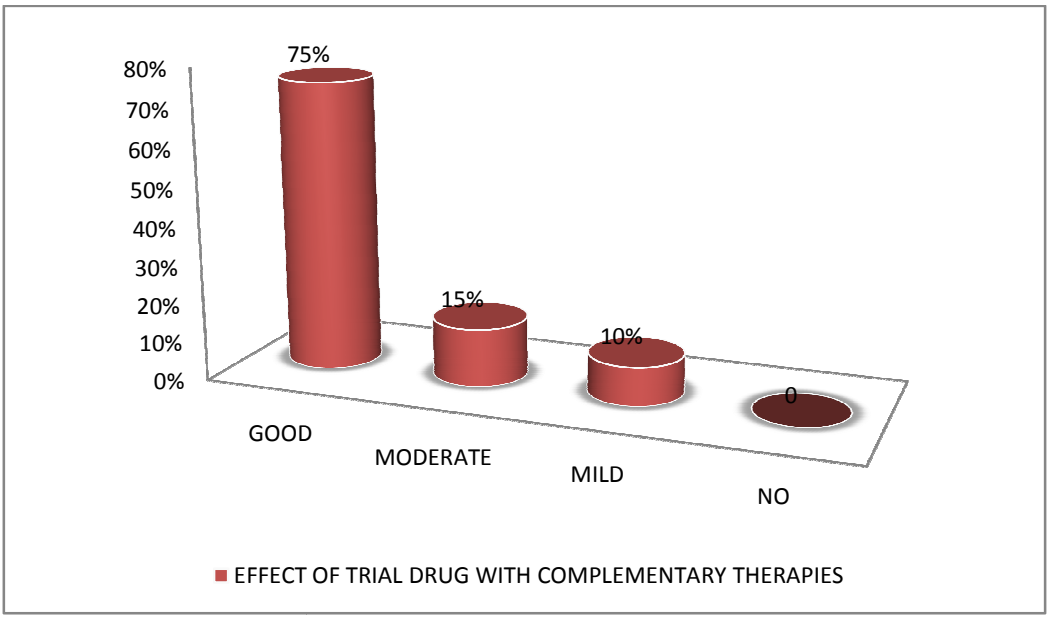
Inference

Administration of trial drug along with complementary therapy reduced severe pain in almost all the cases, mild and moderate cases were notably reduced.

Table 23

EFFECT OF TRIAL DRUG ALONG WITH COMPLEMENTARY THERAPIES

S.NO	EFFECT OF CASES	NO OF CASES	PERCENTAGE %
1.	Good	15	75
2.	Moderate	3	15
3.	Mild	2	10
4.	No	0	0



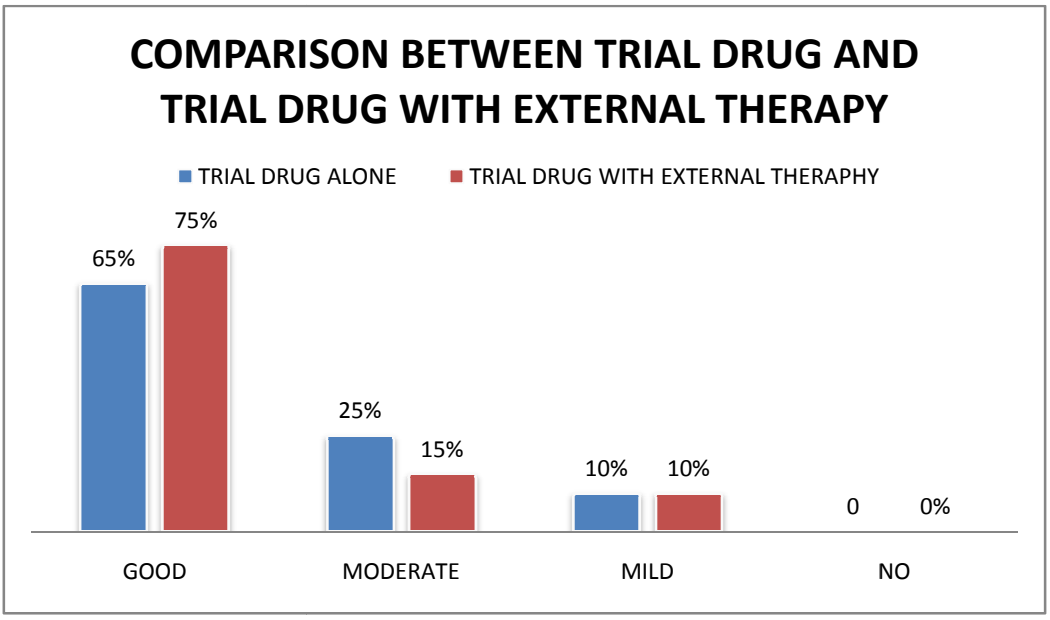
Inference

Administration of trial drug along with complementary therapies had 75% good effect , 15% moderate effect and 10% mild effect not even a single case have reported of having no effect.

Table : 24

COMPARISON BETWEEN EFFECTIVE OF TRIAL DRUG AND TRIAL DRUG WITH COMPLEMENTARY THERAPIES.

S.NO	EFFECT OF THERAPY	TRIAL DRUG ALONE		TRIAL DRUG WITH EXTERNAL THERAPY	
		NO OF CASES	PERCENTAGE %	NO OF CASES	PERCENTAGE%
1.	Good	13	65	15	75
2.	Moderate	5	25	3	15
3.	Mild	2	10	2	10
4.	No	0	0	0	0



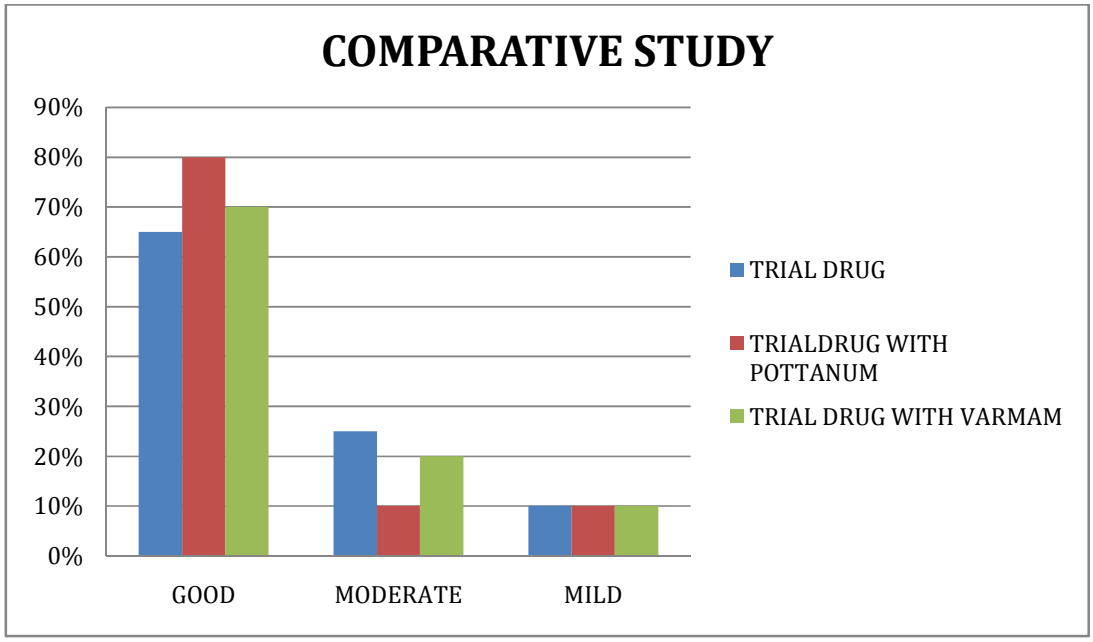
INFERENCE

In comparative study , the trial drug with external therapy is more effective than trial drug alone.

TABLE - 25

COMPARISON BETWEEN EFFECTIVE OF TRIAL DRUG ,TRIAL DRUG WITH POTTANUM, TRIA DRUG WITH VARMAM

S,NO	EFFECT OF THERAPY	TRIAL DRUG ALONE		TRIAL DRUG WITH POTTANAM		TRIAL DRUG WITH VARMAM	
		No of cases	Percentage%	No of cases	Percentage%	No of cases	Percentage&
1	GOOD	13	65	8	80	7	70
2	MODERATE	5	25	1	10	2	20
3	MILD	2	10	1	10	1	10



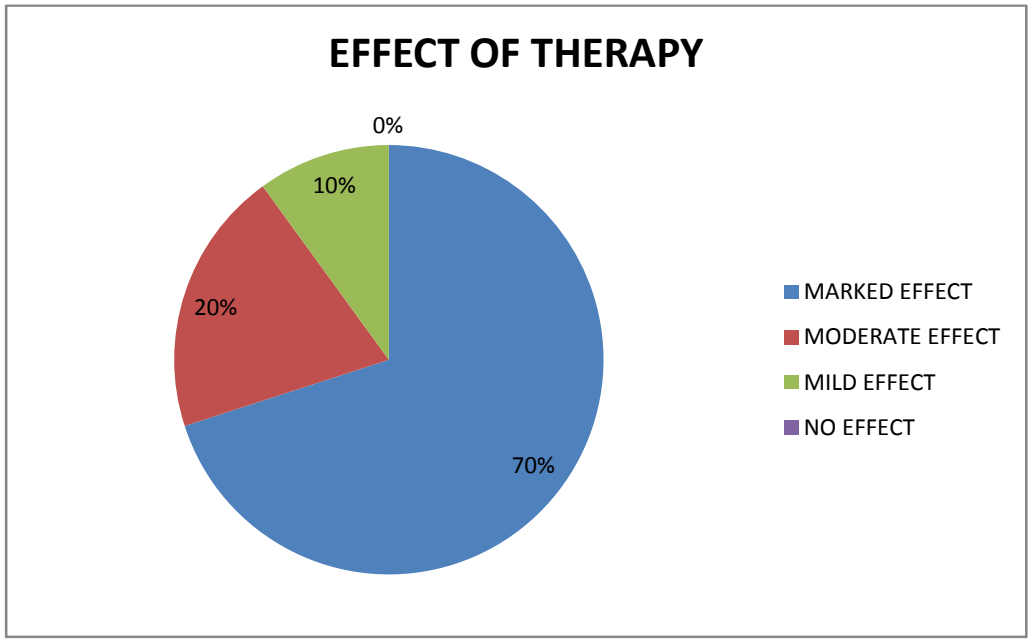
INFERENCE:

In this comparative study conclude that trial drug with pottanum is more effective than other two .

Table 26

EFFECT OF THERAPY

S.NO	EFFECT OF THERAPY	NO OF CASES	PERCENTAGE
1.	Marked effect	28	70
2.	Moderate effect	8	20
3.	Mild effect	4	10
4.	No effect	0	0



Inference

Thus from the analysis of the data collected during the course of treatment and at the end of treatment it is inferred that the overall effect of the therapy (internal, external and complementary) had marked effect of 70%, moderate effect of 20% and mild effect of 10% .

Out Patients of PG-III Sirappu Maruthuvam Department Given

Santhuvatha Choornam- Internal 2. Vatha Ennai – External

S.NO	OP.NO	NAME	AGE/SEX	OCCUPATION	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL NO OF DAYS TREATED	RESULTS
1	63678	Thuraichi	42/F	House wife	26/7/17	12/9/17	48 days	Good
2	65162	Rasathi	57/F	House wife	31/7/17	16/9/17	48 days	Moderate
3	66875	isakkiammal	40/F	Housewife	5/8/17	21/9/17	48 days	Good
4	68061	Swarnam	55/F	House wife	9/8/17	26/9/17	49 days	Good
5	70076	Daniel	60/M	Retired officer	16/8/17	5/10/17	51 days	Good
6	70477	krishnammal	42/F	Housewife	17/8/17	5/10/17	50 days	Good
7	71054	Chandira	50/F	Housewife	19/8/17	6/10/17	48 days	Moderate
8	71915	Isakkiammal	53/F	Housewife	22/8/17	9/10/17	48 days	Good
9	2244	Isakkiammal	56/F	Housewife	14/12/17	2/2/18	50 days	Good
10	892	Susila	45/F	Housewife	20/12/17	17/2/18	49 days	Good
11	1001	Muthukumar	45/M	Clerk	26/12/17	9/2/18	45 days	Good
12	1497	Gnanamani	55/F	Housewife	27/12/18	13/2/18	48 days	Moderate
13	763	Antonyammal	60/F	Housewife	3/1/18	19/2/18	48 days	Mild
14	10172	Abdulkathar	55/M	Saloon	30/1/18	19/3/18	48 days	Good
15	14510	Shanthi	42/F	Beedi rolling	12/2/18	4/4/18	52 days	Good
16	14722	Balamurugan	35/M	Farmer	12/2/18	4/4/18	52 days	Good
17	17150	Selvaraj	60/M	Watchmen	19/2/18	5/4/18	46 days	Mild
18	30518	Basker	44/M	Clerk	2/4/18	19/5/18	48 days	Moderate
19	30873	Rose	38/F	Housewife	3/4/18	20/5/18	48 days	Good
20	30872	Sarabhegam	50/F	Housewife	3/4/18	20/5/18	48 days	Moderate

List of In Patients of PG-III Sirappu Maruthuvam Department Given

1.Santhuvatha Choornam- Internal 2. Vatha Ennai – External with varma and pottanam therapy.

S.NO	IP.NO	NAME	AGE/SEX	OCCUPATION	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL NO OF DAYS TREATED	RESULTS
1	2283	Shanthi	38/F	House wife	16/8/17	8/9/17	24 days	GOOD
2	2428	Arumugam	60/M	Farmer	29/8/17	9/10/17	42 days	GOOD
3	2437	palaniyammal	60/F	Housewife	30.8.17	9.10.17	41days	GOOD
4	3082	Pichammal	50/F	Farmer	18/11/17	11/12/17	24 days	MODERATE
5	3252	Poolaiya	55/M	Farmer	12/12/17	8/1/18	28 days	GOOD
6	3264	Malliga	43/F	Farmer	13/12/17	6/1/18	25 days	GOOD
7	3262	Pappa	58/F	Beedi rolling	13/12/17	3/1/18	22 days	GOOD
8	3373	Saraswathi	60/F	Housewife	28/12/17	31/1/18	35 days	GOOD
9	77	Deivani	60/F	Housewife	17/1/18	29/1/18	13 days	MILD
10	35	Ponnuthai	55/F	Farmer	4/1/18	21/2/18	49 days	GOOD
11	90	Kandaswamy	60/M	Retired officer	18/1/18	12/2/18	26 days	GOOD
12	166	Ramalakshmi	53/F	Housewife	24/1/18	27/2/18	35 days	GOOD
13	199	Somu	60/M	Farmer	26/1/18	14/3/18	48 days	GOOD
14	371	Kasiammal	60/F	Housewife	12/2/18	25/3/18	42 days	GOOD
15	379	Vellathai	60/F	Housewife	13/2/18	7/3/18	23 days	GOOD
16	745	Selvaraj	60M/	Watchmen	19/3/18	25/4/18	37 days	GOOD
17	892	Nagarajan	52M/	Watchmen	3/4/18	26/4/18	24 days	GOOD
18	984	Rasathi	60/F	Housewife	11/4/18	30/4/18	20 days	MODERATE
19	925	Mariammal	52/F	Beedi rolling	5/4/18	21/4/18	17 days	MODERATE
20	488	Saraswathi	60/F	Housewife	22/2/18	9/3/18	16 days	MILD

BLOOD INVESTIGATION OF IP PATIENTS

S.NO	IP.NO	AGE/ SEX	BLOOD SUGAR		BLOOD UREA(MGS%)		SERUM CHOLESTEROL(MGS%)		RA FACTOR	ASO TITRE	C-REACTIVE PROTEIN	
			BT	AT	BT	AT	BT	AT				
1	2283	38/F	102	95	33	33	193	190	-VE	-VE	7.2	3.3
2	2428	60/M	100	97	25	20	214	196	-VE	-VE	15.7	4.1
3	2437	60/F	145	130	23	2O	205	200	-VE	-VE	9.5	2.7
4	3082	50/F	81	96	41	36	205	194	-VE	-VE	14.1	5.3
5	3252	55/M	80	79	21	20	235	215	-VE	-VE	17.2	8.3
6	3264	43/F	100	98	26	20	178	182	-VE	-VE	12.2	5.2
7	3262	58/F	96	100	20	18	206	194	-VE	-VE	11.8	3.3
8	3373	60/F	108	94	34	29	142	168	-VE	-VE	13.3	6.6
9	77	60/F	102	98	21	18	160	174	-VE	-VE	9.4	5.2
10	35	55/F	96	116	26	24	164	178	-VE	-VE	17.2	8.3
11	90	60/M	75	89	40	32	168	176	-VE	-VE	12.4	4.3
12	166	53/F	118	109	20	14	174	179	-VE	-VE	16.3	6.2
13	199	60/M	118	106	25	20	192	199	-VE	-VE	9.5	5.5
14	371	60/F	102	98	32	29	171	184	-VE	-VE	9.6	3.8
15	379	60/F	145	130	23	2O	205	200	-VE	-VE	9.5	2.7
16	745	60M/	102	97	26	20	125	140	-VE	-VE	15.7	6.3
17	892	52M/	112	98	16	14	117	130	-VE	-VE	12.7	4.2
18	984	60/F	115	105	19	16	178	182	-VE	-VE	19.4	7.5
19	925	52/F	113	96	27	22	120	138	-VE	-VE	9.5	2.7
20	488	60/F	104	92	20	18	178	180	-VE	-VE	11.4	7.5

BLOOD AND URINE INVESTIGATIONS OF IP PATIENTS

s.no	Ip.no	Haemotological investigation														Uri ne analysis					
		WBC Total		WBC differential count(%)						Hb mg/dl		ESR mm				BT			AT		
		BT	AT	BT			AT			BT	AT	BT		AT		sug	alb	dep	sug	Alb	Dep
				P	L	E	P	L	E			½ hr	1 hr	½ hr	1hr						
1	2283	8300	8700	67	30	03	66	31	03	9.8	11	14	28	9	16	Nil	Nil	1-3 pus cells	Nil	Nil	NAD
2	2428	6100	7200	50	49	1	52	47	1	14	14.1	4.5	9	3	6	Nil	Nil	NAD	Nil	Nil	NAD
3	2437	7100	7400	68	28	04	67	31	02	11.1	12.3	25	50	12	24	Nil	Nil	NAD	Nil	Nil	Nil
4	3082	7000	7,400	65	30	5	66	33	1	10.4	10.8	11	22	3.5	7	Nil	Nil	Few epithelial cells	Nil	Nil	Nil
5	3252	8000	8500	66	29	05	63	34	03	10.2	11	10	34	9	16	Nil	Nil	NAD	Nil	Nil	NAD
6	3264	7800	7600	65	29	6	67	32	1	10.1	10.9	13	26	4	8	Nil	Nil	NAD	Nil	Nil	NAD
7	3262	7200	7800	63	31	6	66	32	2	8.3	9.6	9	18	4	7	Nil	Nil	NAD	Nil	Nil	NAD
8	3373	8100	7900	70	27	3	66	33	1	10.1	10.8	8	16	3	7	Nil	Nil	NAD	Nil	Nil	NAD
9	77	7200	7600	60	34	6	64	35	1	10.5	11	10.5	21	4	8	Nil	Nil	NAD	Nil	Nil	NAD
10	35	7000	6900	56	42	2	69	30	1	10.8	11	11	22	3	6	Nil	Nil	NAD	Nil	Nil	NAD
11	90	6700	7400	65	30	5	67	32	1	8.5	9	16	32	9	18	Nil	Nil	NAD	Nil	Nil	NAD
12	166	8800	8600	62	28	10	63	34	3	11.1	11.6	15	30	4	9	Nil	Nil	NAD	Nil	Nil	NAD
13	199	10500	9600	60	30	10	64	33	3	10	10.6	7	15	3	7	Nil	Nil	NAD	Nil	Nil	NAD
14	371	8200	7800	65	30	5	60	39	1	11	11.4	24	48	11	22	Nil	Nil	1-3 pus cells	Nil	Nil	NAD
15	379	8400	8500	68	30	02	67	31	02	12.1	13	12	24	8	16	Nil	Nil	NAD	Nil	Nil	NAD
16	745	8000	7600	60	24	6	64	25	1	12.3	12.6	12	35	9	18	Nil	Nil	NAD	Nil	Nil	NAD
17	892	7800	8000	64	34	2	62	34	0	10.5	10.8	12	24	6	12	Nil	Nil	NAD	Nil	Nil	NAD
18	984	8500	8700	67	27	3	68	31	1	10.8	11	10	21	3	7	Nil	Nil	NAD	Nil	Nil	NAD
19	925	9500	9000	70	23	7	64	34	2	8.2	8.9	20	40	9	18	Nil	Nil	NAD	Nil	Nil	NAD
20	488	9900	9000	64	24	8	67	31	2	10.2	10.7	19	38	10	20	Nil	Nil	NAD	Nil	Nil	NAD

BT – Before Treatment AT- After Treatment ESR – Erythrocyte Sedimentation Rate HB – Haemoglobin BS – Blood sugar BU - Blood urea
P-Polymorph L-Lymphocytes E – Eosinophils

BLOOD AND URINE INVESTIGATIONS OF OP PATIENTS

s.no	Op.no	Haemotological investigation														Uri ne analysis					
		WBC Total		WBC differential count(%)						Hb mg/dl		ESR mm				BT			AT		
		BT	AT	BT			AT			BT	AT	BT		AT		sug	alb	dep	sug	Alb	Dep
				P	L	E	P	L	E			½ hr	1 hr	½ hr	1hr						
1	63678	9000	9800	64	30	6	65	32	3	9.9	11	10	22	8	16	Nil	Nil	1-3 pus cells	Nil	Nil	NAD
2	65162	7800	8100	65	30	5	67	32	1	11.3	11.5	12	27	7	14	Nil	Nil	NAD	Nil	Nil	NAD
3	66875	7500	8000	67	27	6	68	30	2	9.1	9.8	7	15	4	9	Nil	Nil	NAD	Nil	Nil	NAD
4	68061	8800	8400	63	32	5	65	34	1	10.9	11.2	14	28	6	12	Nil	Nil	Few epithelial cells	Nil	Nil	NAD
5	70076	8800	9000	70	24	6	68	31	1	9.9	12	8	18	4	12	Nil	Nil	NAD	Nil	Nil	NAD
6	70477	10200	10620	62	20	8	64	32	4	11	11	20	45	15	23	Nil	Nil	NAD	Nil	Nil	NAD
7	71054	6800	7100	55	42	3	64	35	1	11	11.5	27	50	8	15	Nil	Nil	NAD	Nil	Nil	NAD
8	71915	8400	8600	67	31	2	65	31	4	9.6	11.5	18	36	6	13	Nil	Nil	NAD	Nil	Nil	NAD
9	2244	7800	8000	60	38	4	63	36	1	9.5	10	10	20	4	8	Nil	Nil	NAD	Nil	Nil	NAD
10	892	8900	9200	62	34	4	63	34	3	12.5	13	20	41	16	30	Nil	Nil	NAD	Nil	Nil	NAD
11	1001	8000	8500	61	35	4	66	32	2	13	13	6	12	6	12	Nil	Nil	NAD	Nil	Nil	NAD
12	1497	7800	7900	59	37	4	62	36	2	13	15	7	14	2	4	Nil	Nil	NAD	Nil	Nil	NAD
13	763	11200	11300	79	19	2	65	32	3	11.9	12	15	35	16	30	Nil	Nil	NAD	Nil	Nil	NAD
14	10172	7800	7600	50	46	4	61	38	1	12.5	12.6	8	15	3	7	Nil	Nil	1-3 pus cells	Nil	Nil	NAD
15	14510	7800	8000	60	37	3	64	34	2	10.5	11.2	30	66	20	40	Nil	Nil	NAD	Nil	Nil	NAD
16	14722	11000	9100	67	27	4	60	28	1	14.	14	20	40	6	12	Nil	Nil	NAD	Nil	Nil	NAD
17	17150	8100	8300	62	34	4	66	33	1	10.4	11	17	37	12	28	Nil	Nil	NAD	Nil	Nil	NAD
18	30518	7400	7600	69	29	2	63	35	2	11.2	11.5	23	40	20	30	Nil	Nil	NAD	Nil	Nil	NAD
19	30873	7500	7800	56	40	4	61	38	1	9.2	9.8	18	35	6	12	Nil	Nil	NAD	Nil	Nil	NAD
20	30872	10100	9900	64	32	4	65	34	1	11.7	11.6	25	50	12	24	Nil	Nil	NAD	Nil	Nil	NAD

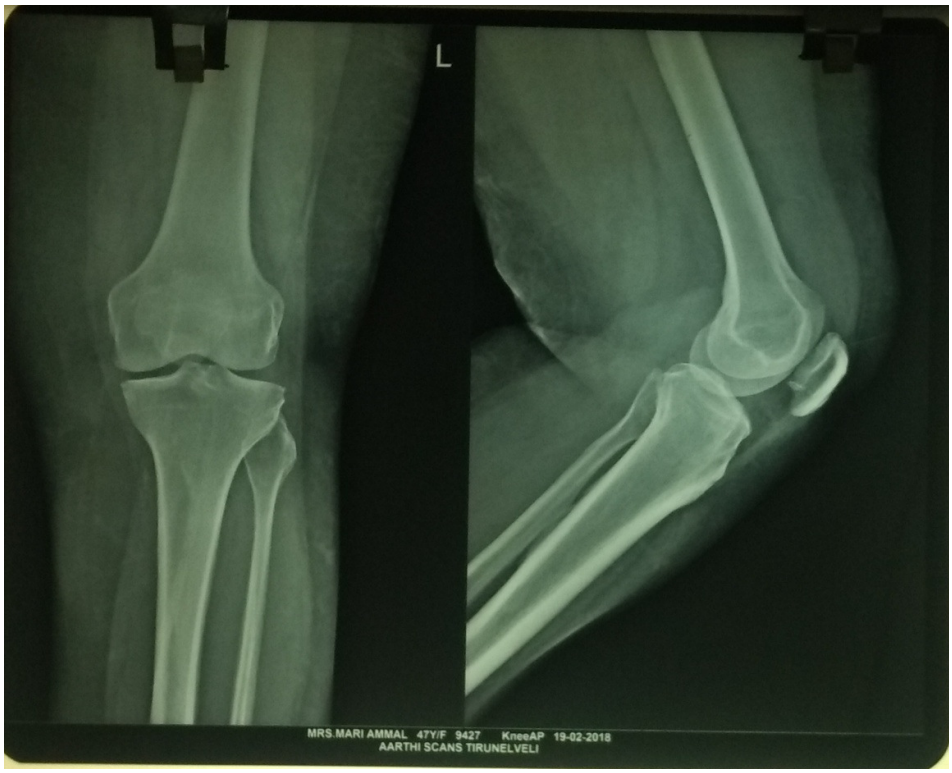
BT – Before Treatment AT- After Treatment ESR – Erythrocyte Sedimentation Rate HB – Haemoglobin BS – Blood sugar BU - Blood urea
P-Polymorph L-Lymphocytes E – Eosinophils

BLOOD INVESTIGATION OF OP PATIENTS

S.no	Op.no	Age/sex	Blood sugar(mgs%)		Blood urea (mgs%)		Serum cholesterol		RA factor	ASOtitre	c-reactive protein	
			BT	AT	BT	AT	BT	AT			BT	AT
1	63678	42/F	88	94	21	20	140	138	-VE	-VE	9.5	2.7
2	65162	57/F	73	81	40	34	214	198	-VE	-VE	11.4	7.5
3	66875	40/F	121	102	24	22	205	191	-VE	-VE	15.7	4.1
4	68061	55/F	115	98	26	20	187	180	-VE	-VE	12.2	5.2
5	70076	60/M	120	114	17	17	200	189	-VE	-VE	14.1	5.3
6	70477	42/F	98	99	21	17	200	178	-VE	-VE	7.2	4.3
7	71054	50/F	89	92	22	20	186	190	-VE	-VE	12.2	5.2
8	71915	53/F	83	90	27	26	164	162	-VE	-VE	11.8	3.3
9	2244	56/F	101	115	28	24	184	179	-VE	-VE	13.3	6.6
10	892	45/F	89	85	28	27	182	180	-VE	-VE	12.6	7.3
11	1001	45/M	134	112	18	19	200	198	-VE	-VE	9.4	5.2
12	1497	55/F	132	96	34	31	185	185	-VE	-VE	17.2	8.3
13	763	60/F	88	98	23	22	207	198	-VE	-VE	12.4	4.3
14	10172	55/M	124	119	35	29	168	172	-VE	-VE	16.3	6.2

15	14510	42/F	70	93	25	25	200	195	-VE	-VE	9.5	5.5
16	14722	35/M	87	93	28	26	129	142	-VE	-VE	9.6	3.8
17	17150	60/M	85	89	34	32	164	162	-VE	-VE	11.8	5.1
18	30518	44/M	70	94	30	31	160	158	-VE	-VE	15.7	6.3
19	30873	38/F	110	105	34	29	158	164	-VE	-VE	12.7	4.2
20	30872	50/F	72	84	37	33	176	185	-VE	-VE	19.4	7.5

DEGENERATIVE CHANGES IN THE LEFT KNEE JOINT



DISCUSSION

The main aim of the treatment was to study the Therapeutic effect of the drug SANTHUVATH CHOORANAM to reduce pain, swelling and restricted joint movements in the disease Santhuvatham.The clinical features of Santhuvatham can be correlated to PolyArthritis in modern science. PolyArthritis is a chronic inflammatory disease associated with symmetrical or asymmetrical involvement of joints.

According to the Gender among the 40 patients selected, the disease was found to be higher in outpatients females 70% and in males 30%.Among In patients 70% females and 30% males.

According to Age group In 31-40 years out patients was 15% and in patients was 5%. In 41-50 years out patients was 40% and in patients was 10% , In 51-60 years outpatients was 45% and in patients 85%.

In Kaalam out of 40 cases 100%cases were in Pithakaalam .

In Paruvakaalam(Season) out of 40 cases 35% cases were included in Munpanikaalam, 22.5% cases were Pinpanikaalam and 17.5%were kaarkalam,15% cases were koothirkaalam,10% cases were muthuvenirkaalam.

Based on Gunam out of 40 cases 87.5% were Rasogunam and 7.5% were Thamogunam, 5% were sathuva gunam.

In Thinai out of 40 cases 82.5% cases were from MaruthaNilam,2.5% were from KurinjiNilam and the remaining 15% cases were NeithalNilam.

In Socio economic status out of 40 cases, 62.5% cases belonged to Middle Class, 32.5% cases belonged to Poor, 5% cases belonged to Rich.

Based on Etiological Factors out of 40 cases 67.5% were due to senility, 22.5 %were due to Occupational and 10% were Exposure to cold.

In Occupational Distribution out of 40 cases,17.5% were Farmers, 55% were Housewife, 5% were clerk and retired officer, 7.5% were watchman and beedi rolling, 2.5% were saloon..

In Vatham out of 40 cases, 100% cases were affected in Samaanan and Viyaanan, 25% cases were affected in Abanan, 85% cases were affected in Devathathan and 15% cases were affected in Kirukaran.

In Pitham out of 40 cases, Saathagam was affected in 100% cases. Anarpitham was affected in 45% cases and Ranjagam was affected in 20% cases.

In Kabam out of 40 cases, Santhigam was affected in 100% .

In Udalthathukkal out of 40 cases, 85% Saaram, 100%Enbu,45% Moolai. 50% kozhuppu ,20% senner was affectedand 17.5% oon was affected.

In Envagaithervugal among the 40 cases, 100% was thontha naadi,

30% seen in sparisam and 25% seen in malam.

While seeing the Naadi among the 50 cases PithaVaathanaadi was found ,VaathaPithanaadi was found 27.5% cases and VaathaKabam was found in 22.5 cases.

In Neikkuri, among the 40 cases, 50% of the case showed combination of ring and pearl pattern, 25% of the case showed snake pattern 15% of the case showed pearl pattern and 10% shows ring pattern.

In Duration of illness out of 40 cases, 47.5% were occur 6 months, 25% occur in 7-12 months and2. 5% occur in 13-18 months and 15% occur in 19-24 months,10% occur in above 30 months.

According to the clinical features all 100% of cases had joint pain, 75% cases showsmorning stiffness, 17.5% has restriction to walk, 57.5% cases shows sleeplessness, 12.5% cases shows loss of weight, 50% shows swelling of joints, 50% shows loss of appetite, 82.5% shows difficulty to walk, 25% shows constipation, 20% shows neck pain and 85% cases shows easy fatiguability.

In Locomotor system the Lower extremity was affected in 90% cases, Upper extremity was affected in 75% cases and both was affected in 77.5% cases.

In Individual joint involvement in27.5% of cases in Hip joint . 90% of cases Knee joint were involved, in 20% cases inWrist joint and 30%cases Ankle joint were involved,5 7.5% cases Shoulder joint was involved and 30% cases Elbow joint was involved. 32.5% cases in minor and major joints in upper and lower limb.65% cases in lumbosacral joint,35% cases in cervical spine

Overall Result in my study - 70% cases showed Good improvement, 20% cases showed Moderate improvement, 10% cases showed Mild improvement.

Laboratory investigation of blood and urine were done for all 40 cases.There were significant changes in blood before and after treatment. Rheumatoid arthritis factor was negative in all cases. Blood sugar, blood urea and serum cholesterol were done. The values were found to be normal in all the cases.

Patients treated with varmam and pottanum treatment showed very good results since there was good reduction in the pain of Santhuvatham patients in this clinical trial.

SUMMARY

A collective and comparative study of the disease Santhuvatham is made covering the all aspects of the disease enclosing siddha and modern science aspects .Study drug standardised are botanical, phyto chemical, pharmacological, and toxicological, these are supportive of trial drug for our santhuvatham.40 cases with santhuvatham were diagnosed clinically, out of 40, 20 admitted as in patients have received varmam and pottnam and 20 as out patients who were observed for clinical diagnosis, Lab Investigations and treatment of trial medicines.The peak age incidence of Santhuvatham was found 51-60 years age group.Clinical diagnosis of the above disease was done on the basis of clinical features described in Yugi Vaidhya Chinthamani and Siddha Maruthuvam.Before admission for study their careful detailed history of the sufferings, duration, their occupation, native etc. are elicited from the 40 selected patients.The trial medicines for the clinical treatment and management of Santhuvatham were SANTHUVATHA CHOORANAM, twice a day with base of hot water and for external use VATHA ENNAI. External therpy pottanum and varmam had effective.Biochemical analysis of SANTHUVATHA CHOORANAM showed that the presence of calcium,chloride,starch,ferrous iron,tannic acid,unsaturated compound,reducing sugarand amino acid.In phytochemicalanalysis,santhuvathachooranamhadcarbohydrate,alkaloid,saponin,terpe noid,phenol.The pharmacological study, the toxicological studies were done.During treatment, all the patients keep under strict pathiyam, a specific dietary regimen, it has been clearly mentioned in review of siddha literature.No any adverse effect of study drugs. All the patients were advised to exercise regularly.The observation made during the clinical study shows that the main drugs SANTHUVATHA CHOORANAM is conducive.

CONCLUSION

Now a days Santhuvatham is more common causing social burden to families.The physiochemical and phytochemical analysis reveals that the trial drug contains important constiuents which have beneficiary effects in arthritis.

The Toxicological studies reveal that the trial drug did not produce any toxicity in rat models.The Preclinical studies reveals that the trial drug has anti inflammatory anti analgesic action .The clinical study shows significant decrease in the symptoms of the disease.The trial drug gives a good confidence in the management of Santhuvatham and economicaly very low cost.No contra indications was noted during the course of treatment.Finally the author conclude that the trial drug SANTHUVATHA CHOORANAM and VATHA ENNAI is effective in SANTHUVATHAM. Combined therapy(pottanum.varmam) with trial drug has given more effective than trial drug alone. For more results further studies should be continued in this.

ANNEXURE – I

PREPARATION AND PROPERTIES OF THE TRIAL DRUG

INTERNAL DRUG: SANTHUVATHA CHOORNAM

Reference: AATHMARAKSHAMIRTHAM

Ingredients:

chithiramoolam Ver	-	Plumbago indica	- 35 gm
Mavilingu pattai	-	Grataevamagna	- 35 gm
Konrai ver	-	cassia fistula	- 35 gm
Murungai ver	-	moringa oleifera	- 35 gm
Erukku ver	-	calotropis gigante	- 35 gm
Veapam ver	-	Azadirachta indica	- 35 gm
Thippili	-	Piper longum	-35 gm
Velarugu ver	-	Enicostemma axillare	- 35 gm
Milagu	-	piper nigrum	- 35 gm
Sangu	-	conch shell	-35 gm

Panchalavanam-kariuppu(table salt),indhuuppu(rock salt),kaluuppu(himalayan crystal salt),valiyaluuppu(glassgall),vediuppu(salt petre)-35 gm

DOSE : 800mg – 1000mg

ADJUVANT : Hot water

DURATION : 48 days

STANDARD OPERATING PROCEDURE

Source of raw drugs

The required drugs for preparation of SANTHUVATHA CHOORANAM(internal) and VATHAENNAI (external) would be purchased from a well reputed country shop and standardized before preparing medicines. This raw drug would be authenticates and then they were purified and the medicines were prepared in Gunapadam laboratory of Government Siddha Medical College, Palayamkottai.

PURIFICATION OF RAW DRUGS:

Root of konrai,murungai,veapam,eruku:

Wash with water and allow it to dry. (PothusuthiMurai)

Chithiriramoolam ver

The root will be baked in steam of milk.

Mavilingu pattai

Scrab the outerlayer of the bark.

Milagu

Soak in butter milk in 3 days then fry it.

thippili

Remove the adulterant and allow it to dry.

Velarugu

Wash with water and allow it to dry

Sangu

Soaked in limestone ,heat it and wash and allow it to dry.

Indhu uppu

Soaked in kaadi neer in 3 days,keep under sunlight ,then dry it.

Kari uppu

Dissolve in 1:7 ratio of water,filter it,then heat it till semisolid form,then add lime juice in low flame and keep it under sunlight.repeat it for 10 times.

Vallaiyal uppu

Dissolve in kaadi neer, keep under sunlight until it dry.

Vediuppu

Add 1:4 ratio of water,heat with low flame,then add 4white egg yolk & heat till bubbles come.filter it and keep it under sunlight,repeat this for 7 times.

Kallu uppu

Soak in kaadi neer.keep under sunlight,allow it to dry.

PREPARATION:

The above mentioned drugs are purified properly as said above and they are dried in shade and made into powder it separately and mix well.

DRUG STORAGE:

The trial drug santhuvatha Chooranam is stored in a clean and dry air tight container and it is dispensed to the patients in packets.

EXTERNAL MEDICINE

VATHA ENNAI

Ref : Agasthiyar vaithiya soothiram-650 (pg no-280,281)

Ingredients :

Veapam ennai	-	Neem oil	-	750 ml
Punga ennai	-	punga oil	-	750 ml
Amanakkuennai	-	castor oil	-	750 ml
Punnai ennai	-	Fennel oil	-	750 ml
Nalla ennai	-	Gingely oil	-	750 ml
Poondu	-	Allium sativum	-	17.5g
Vasambu	-	Acorus calamus	-	17.5g
perugayam	-	Ferula foetida	-	17.5g
Thirikadugu	-			
Sukku	-	zingiber officinale		
Milagu	-	piper nigrum		- 17.5 g
Thippili	-	piper longum		
Omam	-	Trachyspermum ammi		-17.5 g
Kirambu	-	Syzigium aromaticum		-17.5g
Sathakuppai	-	Anethum graveolens		-17.5g
Kadugurokini	-	Picrorhiza scrophulariiflora		-17.5g
Chithiramoolam ver	-	Plumbago indica		-17.5g
Kaadi neer	-	vinegar		-2880 ml

PREPARATION :

Except oil, all drugs are grind with kaadi neer,then add 5 types of oils,kaadi neer into the grinding mixture& mix well,heat it,heat it,till melugu patham,then oil is filtered and transfer into another container . It can be used as an external application which cures all vatha diseases.

DRUG STORAGE:

The trial drug is stored in clean dry air tight container and it is given to the patients in disposable pet bottles.

EXTERNAL THERAPY

SNEGHA POTTANAM

Ingredients:

Nochi kolunthu	-	vitex negumdo
Aamanaku illai	-	ricinus communis
Sirramanaku vidai	-	ricinus communis
Paruthikottai	-	gossypium herbaceum
theankai thiruval	-	cocos nucifera
veapamkottai	-	azadirachta indica
thazhuthalai kolzhunthu	-	clerodendrum phlomoidis
punnai vethai	-	calophyllum inophyllum
,magilam vethai	-	mimusops elengi
samuthira palam	-	barringtonia acutangula
koliyavarai vethai	-	canavalia lineata

PREPARATION

All the ingredients are keep in pottanam,dip in the heated neem oil,apply to the affected area for 15-30 minutes.

It cures the santhuvatham and some vatha diseases.

GUNAPADAM ASPECT

INTERNAL MEDICINE : SANTHUVATHA CHOORANAM

1.Tamil name-chithiramoolam

வேறுபெயர்

அணிஞ்சில், அதிகநாரி, அழல், எரி, எழுநா, ஒலி, கனலி, சித்திரமூலி,தழல், வன்னி, கொடிவன்னி

English name - ceylon lead wort

Botanical name - plumbago zeylanica

Family - plumbaginaceae

Part used - root

சுவை : கார்ப்பு

தன்மை : வெப்பம்

பிரிவு :கார்ப்பு

Constituents:

Plumbagin I, Isohinanolone II, Plmbagic acid III, Beta sitosterol, transcinngemic acid, Vanillic acid.

Action :

Anti periodic

Diaphoretic

Root:

Digestive power & promote the appetite.

பொதுகுணம் :

"கட்டிவிரணங்கிரந்திகால்கள் அரையாப்புக்
கட்டிச்சூலைவீக்கங் காழ்மூலம் - முட்டிரத்தக்
கட்டுநீரேற்றங் கனத்தபெருவயிறும்
அட்டுங் கொடிவேலியாம்"

2.Tamil name-mavilingam

வேறுபெயர் : மாவிலங்கு குமாரகம் வரணி

English name : three leaud capu

Botanical name: crataeva magna

Family : capparaceae

Part used	:	bark
சுவை	:	இனிப்பு
தன்மை	:	தட்பம்
பிரிவு	:	இனிப்பு

Constituents:

cerylalcohol, friedelin,betulinic acid,diosgenin,sitosterol glucoside,cadabacine,lupeol,tannin,saponin,glucocapparin.

Action:

- Rubefacient
- Laxative
- Lithontriptic

பொதுகுணம் :

சுரங்கடியின் றோடந் தொலையாத வாதம்
உரம்பெறு விடங்க ளொழியும் -அரமுங்
கருமா வடுவயிலுங் கண்டஞ்சுங் கண்ணாய்
ஒருமாவி லிங்குக் குரை.

3. Tamil name-sarakonrai

வேறுபெயர்: கொன்றை தாமம் மதலை இதழி

Botanical name	:	cassia fistula
Family	:	caesalpinaceae
Part used	:	root
சுவை	:	கைப்பு துவர்ப்பு
தன்மை	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Constituents:

Tannin, phlobaphenes,oxyanthraquinone substance.

Action

Purgative

Tonic

Febrifuge

பொதுகுணம் :

பாண்டரங்கர் பூணாய்ப் பறக்கடித்து மேகத்தை
யாண்டாங்கக் கைக்குள்வச மாக்குமே- காண்டற்
குதவிசில செய்துடலை யோம்புமிது நீபார்
இதழியெனுங் கொன்றைபுவி யில்

4. Tamil name-murungai

வேறுபெயர்

சிக்குருகிரஞ்சம்
கிழவிசோபாஞ்சனம்

English name	-	Drum stick
Botanical name	-	moringa oleifera
Family	-	moringaceae
Part used	-	root
சுவை	:	கைப்பு துவர்ப்பு இனிப்பு
தன்மை	:	தட்பம்
பிரிவு	:	இனிப்பு

Constituents-.spirochin alkaloid,moringine ,moringinine.

Action

- Antispasmodic
- Stimulant
- Expectorant
- Diuretic
- Antilithic

பொதுகுணம் :

பிஞ்சால் திரிதோடம் பெரும்பூ வால்போகம்
உஞ்சுவிழிக் குக்குளிர்ச்சி யுஞ்சேரும் - விஞ்சிலைவெப்
பாற்றுந்தோல் நஞ்சறுக்கும் அவ்வேர்வா தச்சினத்தை
யாற்று முருங்கையி னது.

5. Tamil name- Erukku

வேறுபெயர்

அருக்கன்

English name - Madar

Botanical name - Calatropis gigantea

Family - asclepiadaceae

Part used - root

சுவை : கைப்பு காரம் இனிப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

Constituents:

Beta amyrin, alpha isomeric crystalline alcohols, giganteol, and iso iganteol.

Action

Alterative

Tonic

Antispasmodi

பொதுகுணம் :

மன்னனையுங் கையெடுக்க வைத்தெயிற்றி னேயகற்றி
யுன்னு பிணிப்பணியை யோட்டுதலாற் -சொன்னேன்
எருக்கெனவே பூமி யினிலே விளங்கும்
அருக்க மருக்கனென லாம் (தே.வெண்பா)

6.Tamil name-vembu

வேறுபெயர்

அரிட்டம் நிம்பம் துத்தை

English name - Neem

Botanical name - azadirachta indica

Family - meliaceae

Part used - root

சுவை : கைப்பு சிறுதுவர்ப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

Constituents:

Nimbidiol, margolinin,margolilin, nimbilin, nimolinin, nimbolide .

Action

Emetic

Anthelmintic

பொதுகுணம் :

புந்தியிதைத் தீட்டுவிக்கும் புன்பிணியை யோட்டுவிக்கு
மிந்தியத்தை நன்றா யிசைவிக்கும் -சந்ததமம்
வீறுண்டாங் கற்ப மிகவுண்டா மெஞ்ஞான்றும்
மாறன்றா ரையமில்லா மல் (தே.வெண்பா)

7. Tamil name- thippli

வேறுபெயர்

ஆர்கதி, உண்சரம், உலவைநாசி, காமன், குடோரி, கோழையறுக்கி, பிப்பிலி, ஆதிமருந்து

English name - long pepper
Botanical name - piper longum
Family - piperaceae
Part used - fruit

சுவை : இனிப்பு
தன்மை : தட்பம்
பிரிவு : இனிப்பு

Constituents

Piperine, rutin beto - carpophylleneliperline, piperamine, lialool

Action

Stimulant

carminative

பொதுகுணம் :

‘கட்டியெதிர்நின்றுகடுநோயெல்லாம் பணியும்
திட்டிவினையகலும் தேகமெத்த - புட்டியாம்
மாமனுக்குமாமமெனமற்றவர்க்குமற்றவனாங்
காமமெனுந் திப்பிலிக்கும் கை” -தேரன்வெண்பா

8. Tamil name-vellaruku

வேறுபெயர் : வல்லாரி

English name - indian white head

Botanical name - enicostemma axillare

Family - gentianaceae

Part used - root

சுவை : கைப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

Constituents

Alkaloids, carbohydrate, flavonoids ,tannins, terpenoids.

Action

- Stomachic
- Tonic
- Alterative
- Laxative
- Febrifuge

பொதுகுணம் :

குன்மமொடு வாய்வு குடல்வாதம் சூலையிவை
சென்மம்விட் டோடிச் சிதையுங்காண் -வன்முலையாய்
உள்ளுறுகி ரந்திசொறி யொட்டிய சிரங்குமறும்
வெள்ளறுகு தன்னை விரும்பு.

9. Tamil name-milagu

வேறுபெயர்

கலிணை,கோளகம்,திரங்கல்,சருமபந்தம்,வள்ளிசம்,மாசம்

English name - black pepper

Botanical name - pepper nigrum

Family - piperaceae

Part used - unriped fruit

சுவை : கைப்பு,கார்ப்பு

தன்மை : வெப்பம்

பிரிவு : கார்ப்பு

Constituents

Pipenine, Superoxide anions, nitrioxdie,dipiperamicles D& E, Piptginne, wisanine.

Action

- Acrid
- Carminative
- Antiperiodic
- Rubefacient
- Stimulant
- Resolvent
- Antivatha
- antidote

பொதுகுணம் :

இதனால் வாதநோய்தீரும்

10. Tamil name: indhuppu

வேறுபெயர்

சைந்தவம். சிந்தூரம். மதியுப்பு

Chemical name : sodium chloride impure

English name : rock salt

Action :

- highly carminative
- Stomachic
- Digestive
- Cathartic
- Emetic

பொதுகுணம்

அட்டகுன்ம மந்தம் அசிர்க்கரஞ்சூர் சீதபித்தந்
துட்டவையம் நாடிப்புண் டோடங்கள் - கெட்டமலக்
கட்டுவிட விந்தையக் காமியநோய் வன்கரப்பான்
விட்டுவிட விந்துப்பை விள்.

11. Tamil name :Kariuppu

வேறுபெயர்

சோற்றுப்பு கடலுப்பு. சமுத்திரலவணம்

Chemical name : sodium chloride

English name :tablesalt, common salt

Action :

- Antiseptic
- Antiperiodic
- Anthelmintic
- Deobstruent

பொதுகுணம்

மந்தம் பொருமலறும் வாயுவும்போம்தீபனமாம்
தொந்தித்த ஜயந் தொடருமோ- சந்ததமும்
அக்கினியின் புஷ்டி அடருங் கறியுப்பால்
சிக்குகின்ற நீரிறங்குஞ் செப்பு.

12. Tamilname : valiyaluppu

English name: selvitri

பொதுகுணம்

துளையார் குடல்வாதத் தொந்தவா தத்தோ
டிளையாச் சுவாசமறு மின்னும்-வளையலுப்பாற்
குன்மவலி சூலைவெப்பங் கூறாப்பி லீகமிவை
சென்மம்விட் டோடுமெனத் தேர்.

13. Tamil name – Vediuppu

வேறுபெயர்

பொட்டிலுப்பு . படைகாரன். நவச்சாரமித்ரு

Chemical name : potassium nitrate

English name : salt petre

Action

- Refrigerant
- Efficient diuretic
- Disphoretic

பொது குணம்

மல்லாரு மட்டகுன்ம மாதருத ரக்கட்டி
கல்லா மதைப்புநீர்க் கட்டருக –லெல்லாமே
கம்பிகம்பி யென்றுங் கருவுண்டா மங்கிநின்ற
கம்பிகம்பி யென்றுரைக்குங் கால்

14. Tamil name : sangu

வேறுபெயர்

நந்து. சுத்தி. வாரணம்.இடம்புரி.

Zoological name : Turbinella rapa

English name : conch shell

Action

- Anodye
- Carminative
- Digestive
- Astringent

பொது குணம்

கசிவா மிரத்த பித்தங் கண்ணோய்க ளேகும்
பசியாறும் வாதம் பறக்கு –மிசிவுடனே
தங்கு முளைவிரணந் தானகலு மேவெள்ளைச்
சங்கமது வுண்டாயிற்றான்.

Fig : 1 Ingredients of SANTHUVATHA CHOORANAM

INTERNAL MEDICINE

Chithiramoola Ver

Erukku

Konrai ver

Murungai Ver

Maavilingapattai

Thippili

Veppam ver

Vellarugu Ver

Milagu

Valaiyaluppu

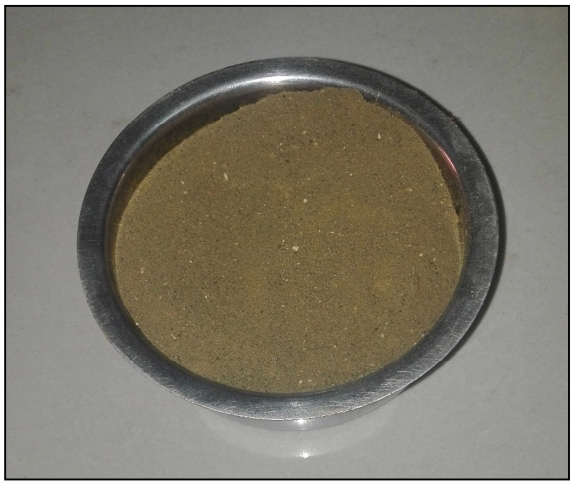
Indhuppu

Kalluppu

Kariuppu

Vediuppu

Sangu



Santhuvatha chooranam

EXTERNAL MEDICINE

1.Tamil name :poondu

Botanical name	:	Allium sativum
Family	:	liliaceae
Part used	:	bulb
suvai	:	karppu
thanmai	:	veppam
pirivu	:	karppu

Constituents:

allyl propyl chisulphide, diallyl disulphide,a allicin, allisatin I &II ,allin &amino acids

Action

- Carminative
- antirheumatic
- Stimulant
- Tonic
- Expectorant

பொது குணம்

சன்னியொடு வாதந் தலைநோவு தான்வலி
மன்னிவரு நீர்க்கோவை வன்சீதம்- அன்னமே !
உள்ளுள்ளி கண்பாய் உளைமூல ரோகமும் போம்
வெள்ளுள்ளி தன்னால் வெருண்டு (அ.கு.)

Uses:

Juice used as rubefacient liniment act very beneficially in infantile convulsions, other nervous and spasmodic affections.

2.Tamil name : vasambu

Botanical name	:	acorus calamus
Family	:	acoraceae
Part used	:	rhizome
Suvai	:	karppu

Thanmai : veppam

Pirivu : karppu

Constituents

volatile oil, asarone, phenylindane derivative, phenyl propane derivative.

Action

- Stimulant
- Emetic
- Antispasmodic
- Carminative
- Nervine sedative

பொதுகுணம்

பாம்பாதி நஞ்சற் புதப்புண் வலிவிடபாகங் குன்மம்
சூம்பா ரிரத்தபித் தம்முக நாற்றம்வன் சூலைசன்னி
வீம்பாம்பை காசம் பிலீகஞ் சிலிபதம் வீறிருமல்
தாம்பாங் கிருமி யிவையேரு மாசிவ சம்பினையே. (தே.கு.)

Uses:

Used in dyspepsia ,fever,skin disease,expectorant,stomachic

3.Tamil name: Perungayam

Botanical name : ferula asafoetida

Family : apiaceae

Part used : dried latex

Suvai : kaippu ,karakarappu

Thanmai : vepam

Pirivu : karppu

Constituents:

organic sulphur compound, allyl persulphide 2 turpenes, ferulic acid,malic acid ,acetic acid, valerainic acid.

Action

- Stimulant
- Carminative
- Antispasmodic
- Expectorant

பொதுகுணம் :

தந்தவே தந்த மூலத்தெழும்பிணி
சருவகாளம் விருச்சிகங்கீடம்மா
மந்தம்வாதம் உதாவர்த்தம் அல்குல்நோய்
மார்பணங்கட்ட குன்மம்மகோதரம்
உந்துகெர்ப்பத்தின் வித்திரஞ்சூலைச்சூர்
உதிரப்பூச்சி சிலேத்துமத்துறும்வவலி
வந்தமெய்க்கடுப் போடிவைமுற்றுமே
மாயுநாறுநற் காயங்கிடைக்கினே. (தே.கு.)

Uses

Used in vatha disease,acid peptic disease

4.Tamil name; chukka

Botanical name	:	zingiber officinale
Family	:	zingiberaceae
Part used	:	rhizome
Suvai	:	karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

diarylheptanoids,essential oil,gingerdiol.

Action

- Local stimulant
- Rubefacient

பொதுகுணம் :

‘வாதபிணிவயிறூதற் செவிவாய்
வலிதலை வலிகைல வலியிருவிழிநீர்
சீதத் தொடுவரிபேதிப் பலரோ
சிகமலிமுகமகமுகமிடிகபமார்
சீதச் சுரம்விரிபேதச் சுரநோய்
தெறிபடுமெனமொழிகுவர்புவிதனிலே
ஈதக் குதவுமிதீதுக் குதவா
தெனும்விதியிலைநவசுறுகுணமுனவே’’.

Uses

Used in indigestion, hyperacidity,cough ,asthma,oedema,cardiac disease.

5.Tamil name : milagu

Botanical name	:	pipernigrum
Family	:	piperaceae
Part used	:	unriped fruit
Suvai	:	kaippu,karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

amide- pipercide, oleoresin,volatile oil, alkaloid piperine.

Action

- Rubefacient
- Stimulant to skin
- Resolvent

Uses

Used in hemiplegia,piles,peptic ulcer,vatha disease.

6.Tamil name : thippili

Botanical name	:	piper longum
Family	:	piperaceae
Partused	:	fruit
Suvai	:	inippu
Thanmai	:	thatpam
Pirivu	:	inippu

Constituents:

Essential oilwhich consist of monocyclic sesquiterpenes.

Action

- Rubefacient.

பொதுகுணம் :

‘கட்டியெதிர்நின்றுகடுநோயெல்லாம் பணியும்
திட்டிவினையகலும் தேகமெத்த - புட்டியாம்
மாமனுக்குமாமமெனமற்றவர்க்குமற்றவனாங்
காமமெனுந் திப்பிலிக்கும் கை”

-தேரன்வெண்பா

Uses

Used in pepticulcer,giddiness.

7. Tamil name; omam

Botanical name	:	trachyspermum ammi
Family	:	apiaceae
Part used	:	fruit
Suvai	:	karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

ajowan oil ,fatty oil, bergapten.

Action

- Antispasmodic
- Tonic
- Carminative
- Stimulant
- Antiseptic

Uses

Used in Cough ,pepetic ulcer

8.Tamilname; kirambu

Botanical name	:	syzygium aromaticum
Family	:	myrtaceae
Part used	:	flowerbud
Suvai	:	karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

ellagitanin,eugenin,caryophyllene,eugenol,naphthalane,volatile oil.

Action

- Carminative
- Stomachic

பொதுகுணம்

"பித்த மயக்கம் பேதியொடு வாந்தியும்போம்
சுத்தவிரத் தக்கடுப்புந் தோன்றுமோ – மெத்த
இலவங்கங் கொண்டவருக் கேற் சுகமாகும்
மலமங்கே கட்டுமென வாழ்த்து

9.Tamilname: sathakuppai

Botanical name	:	anethum graveolens
Family	:	umbelliferae
Part used	:	seed
Suvai	:	inippu,karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

Seed given an essential oil known as dill oil containing flavonoids, beta sitosterol glucoside containing carvone.

Action

- Carminative
- Stomachic
- Aromatic
- Stimulant
- Diuretic

பொதுகுணம் :

வாதமொடு சூதிகா வாதம் சிரசுநோய்
மோதுசெவி நோய்கபநோய் மூடுசுரம்- ஓதுகின்ற
மூலக் கடுப்பு முதிர்பினசம் போகும்
ஞாலச் சதகுப்பை நாடு. (அ.கு.)

Uses:

Anti vatha, head ache,earache.

10. Tamilname : Kadugurokini

Botanical name	:	picrorhiza kurroa
Family	:	scrophulariaceae

Part used	:	rhizome
Suvai	:	kaippu
Thanmai	:	veppam
Pirivu	:	karppu
Constituents	:	picrorrhizin

Action

- Antiperiodic
- Stomachic
- Anthelmintic

பொதுகுணம் :

மாந்தஞ் சுரமையம் வாயுகரப் பானாமஞ்
சேர்ந்தமலக் கட்டு திரிதோடம்- போந்தபொட்டுப்
புண்வயிறு நோயிவைபோம் பொற்கொடியே – பேதியுண்டாம்
திண்கடுகு ரோகணிக்குத் தேர் (அ.கு.)

Uses

Puerperal eclampsia, respiratory disease.

11. Tamil name; chithiramoolam

Botanical name	:	plumbago zeylanica
Family	:	plumbaginaceae
Part used	:	root
Suvai	:	karppu
Thanmai	:	veppam
Pirivu	:	karppu

ChemicalConstituents:

Plumbagin I, Isohinanolone II, Plmbagic acid III, Beta sitosterol, transcinngemic acid, Vanillic acid.

Action

- Stomachic
- Tonic

பொதுகுணம் :

‘‘கட்டிவிரணங்கிரந்திகால்கள் அரையாப்புக்
கட்டிச்சூலைவீக்கங் காழ்மூலம் - முட்டிரத்தக்

கட்டுநீரேற்றங் கனத்தபெருவயிறும்
அட்டுங் கொடிவேலியாம்”

12. Tamilname: Aamanukku ennai

English name	:	castor oil
Botanical name	:	jatropha curcas
Family	:	euphorbiaceae
Part used	:	seed
Suvai	:	karppu
Thanmai	:	veppam
Pirivu	:	karppu

Constituents:

Glycosides, arabinose, lipase, fats, fixed oils.

Action

- Laxative
- Emollient

Uses

It relieves constipation, act as antivatha .

13. Tamilname: nalla ennai

Botanical Name	:	Sesamum indicum
English Name	:	gingelly oil
Family	:	Pedaliaceae
Part used	:	Seeds
Suvai	:	inippu
Thanmai	:	veppam
Pirivu	:	inippu

Constituents

Vitamin A, Sesamin, sesamolin, phytosterol

Action

- Demulcent
- Laxative
- Nutritive

- Emollient

Uses:

It gives immunity , cure ear and eye disorder,scabies,wound

14. Tamilname: pungu ennai

Botanical Name	:	Pongamia pinnata
Family	:	Fabaceae
Part used	:	seed
Suvai	:	kaippu,thuvaruppu
Thanmai	:	veppam
Pirivu	:	karppu

Chemical Constituents:

Karangin, Pongamol, Galbone, dimethylpuranol

Action

- Antiseptic
- Stimulant

பொதுகுணம் :

“வாதக் கடுப்புமகாமூர்ச்சைதாபசுரம்
வாதகுன்மம் ரத்ததால் வந்திடுநோய் - ஒதுகின்ற
பண்புரையும் வல்விடமும் போகும் திரண்டருண்டே
பண்புறுங் கம்வேர்க்குப் பார்”

-அகத்தியர் குணவாகடம்.

15. Tamilname- punnai ennai

Botanical name	:	calophyllum inophyllum
Family	:	calophyllaceae
Part used	:	seed
Suvai	:	kaippu
Thanmai	:	veppam
Pirivu	:	karppu

Chemical constituents

leucocyanidin,calophyllolide

Action

- Anthelmintic
- Caustic

Uses

Seed oil is highly used in rheumatism,antipsoric,gonorrhea, scabies.

16.Tamil name: vembu ennai

Botanical name	:	azadirachta indica
Family	:	Meliaceae
Partused	:	seed
Suvai	:	kaippu
Thanmai	:	veppam
Pirivu	:	karppu

Chemical constituents:

Nimbidiol,margocinin, margocilin, nimbilin,nimolinin,nimbolide.

Action

- Stimulant
- Antiseptic
- insecticide

Uses

Anti vatha disease, scabies, eczema,fever cured.

17. Tamilname; kaadineer

Common name	:	rice vinegar

Uses :

As a antiseptic.

EXTERNAL MEDICINE - VATHA ENNAI

Poondu

Vasambu

Milagu

Perungayam

Chukku

Thippili

Omam

Kirambu

Sathakuppai

Kadugurogini

Chithiramoolam

Aamanakku Ennai

Nallannai

Pungu ennai

Punnai ennai

Vembu ennai

Kaadineer

Vatha Ennai

EXTERNAL THERAPY

SNEGHA POTTANAM

1. Tamil name –nochi

Botanical name - Vitex negundo

Family - Lamiaceae

Part used - Leaf

Action

- Analgesic
- Anti-inflammatory
- Antimicrobial
- Carminative
- Muscle relaxant

Uses: Relieves in pain and inflammation of muscles and joints. Used as fomentation in sprains ,rheumatism ,swelled testicles, contusions.

2. Tamil name –aamanakku

Botanical name – Ricinus communis

Family – Euphorbiaceae

Part used - Leaf

Action:

Anti vatha

Uses:

Cure inflammation,relieves pain , to pacify vata dosha.

3. Tamil name –sirramanakku

Botanical name - Ricinus communis

Family - Euphorbiaceae

Part used - Seeds

Action

Anti vatha

Uses

Cure vata dosha related disorders like arthritis,facial paralysis and abdominal disorders.

4.Tamil name –paruthi

Botanical name - Gossypium herbaceum

Family - Malvaceae

Part used - Seeds

Action

Anti viral

Anti bacterial

Uses:

Externally ,it is used to treat herpes,scabies,wounds and orchitis

5.Tamil name- thenkai

Botanical name – Cocos nucifera

Family – Arecaceae

Part used – Grated coconut

Action

Vermicide

Uses

Helps relieve symptoms associated with chronic fatigue syndrome.

6.Tamil name- veambu

Botanical name - Azadirachta indica

Family – Meliaceae

Part used - Seed

Action

Anthelmintic

Antiperiodic

Antiseptic

Uses

Used to treat boils .rheumatism,ringworm,ulcers.

7.Tamil name – thazhuthalai

Botanical name- clerodendrum phlomoidis

Family – lamiaceae

Part used- leaf

Action

Alterative

Astringent

Uses:

Leaves is applied externally on swelling.

8.Tamil name- Punnai

Botanical name - Calophyllum inophyllum

Family – Calophyllaceae

Part used - Seed

Action

Anthelmintic

Caustic

Molluscicidal activity

Uses:

Externally as an analgesic against rheumatism and sciatica and as a medication against swellings,ulcers,scabies.

9.Tamil name: magilam

Botanical name – Mimusops elengi

Family – Sapotaceae

Part used - Seed

Action

Tonic

Astringent

10.Tamil name – samuthira pazham

Botanical name – Barringtonia acutangula

Family – Lecythidaceae

Part used – Dried fruit

Action

Antibiotic

Uses

It is used as topical. And pacifies vatha.

11. Tamil name – koliyavarai

Botanical name – Canavalia lineata

Family - Fabaceae

Part used – Seeds

Uses:

All kinds of inflammatory disease and atopic dermatitis.

Nochi

Amanakku

Sitramanakku

Paruthi

Thengai

Vembu

Thaluthalai

Magilam

Koliavarai

Samuthira Pazham

ANNEXURE II

BIO – CHEMICAL ANALYSIS

BIO – CHEMICAL ANALYSIS OF SANTHUVATHA CHOORANAM

PREPARATION OF THE EXTRACT:

5gms of the drug was weighed accurately and placed in a 250ml clean beaker then 50ml distilled water is added and dissolved well. Then it is boiled well for about 10 minutes. It is cooled and filtered in a 100ml volumetric flask and then it is made to 100ml with distilled water. This fluid is taken for analysis.

QUALITATIVE ANALYSIS:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	**Test for calcium:** 2ml of the above prepared extract is taken ina clean test tube. To this add 2 ml of 4%ammonium oxalate solution.	A white precipitate is formed.	Indicates the presence of calcium.
2.	**Test for sulphate:** 2ml of the extract is added to 5%bariumchloride solution.	No white precipitate is formed	**Absence of sulphate.**
3.	**Test for chloride:** The extract is treated with silvernitrate solution	A white Precipitate is formed.	**Indicates the presence of Chloride**
4.	**Test for carbonate:** The substance is treated with concentrated Hcl.	No brisk effervescence is formed	Absence of carbonate.
5.	**Test for Starch:** The extract is added with weak iodinesolution.	Blue colour is formed	**Indicates the Presence of starch.**
6.	**Test for Ferric Iron:** The extract is treated with concentrated glacial acetic acid and potassium ferro cyanide.	No blue colour is formed.	Absence of ferric iron.
7.	**Test of FerrousIron:** The extract is treated with concentrated Nitric acid and ammonium thiocyanide solution.	Blood red Colour is formed.	**Indicates the presence of ferrous iron**.
8.	**Test for phosphate:** The extract is treated with ammonium molybdate and concentrated nitric acid.	No yellow Precipitate is formed.	Absence of phosphate
9.	**Test for albumin:**	No yellow	Absence of

	The extract is treated with Esbach's reagent.	precipitate formed.	albumin.
10.	**Test for Tannic acid:** The extract is treated with ferric chloride.	Blue black precipitate is formed.	**Indicates the presence of Tannic acid.**
11.	**Test for unsaturation:** Potassium permanganate solution is added to the extract.	It gets decolorised.	**Indicates the Presence of unsaturated compound.**
12.	**Test for the reducing sugar:** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8-10 drops ofthe extract and again boil it for 2 minutes.	colour change occurs.	Indicates the presence of reducing sugar.
13.	**Test for amino acid:** One or two drops of the extract is placed on a filter paper and dried well. After drying,1% ninhydrin is sprayed over the same and dried it well.	Violet Colour develops.	**Indicates the presence of amino acid.**
14.	**Test for zinc:** The extract is treated with Potassium ferrocyanide.	No white Precipitate is formed	Absence of zinc.

Inference:

The given sample of "SANTHUVATHA CHOORANAM" contains calcium, chloride, Starch, Ferrous iron, tannic acid, unsaturated compound ,reducing sugar and amino acid.

PHYTOCHEMICAL ANALYSIS

QUALITATIVE METHOD OF SANTHUVATHA CHOORANAM

S.NO.	TEST NAME	RESULT
1	**Carbohydrate**	**Present**
2	**Protein**	**Absent**
3	**Alkaloid**	**Present**
4	**Flavanoid**	**Absent**
5	**Glycoside**	**Absent**
6	**Steroid**	**Absent**
7	**Saponin**	**Present**
8	**Phenol**	**Present**
9	**Tannin**	**Absent**
10	**Terpenoid**	**Present**

Procedure

Test for Carbohydrates - Benedict's test (Brain & Turner, 1975)

To 0.5 ml of test drug about 0.5 ml of Benedict's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic coloured precipitate indicates the presence of sugar.

Brain KR, Turner TD. The Practical Evaluation of Phytopharmaceuticals. Bristol:Wright-

Glycosides (Ansari, 2006)

Keller-Killiani Test: To 2 ml of the extract, glacial acetic acid, one drop 5% FeCl3 and conc. H2SO4 was added. Reddish brown colour appeared at junction of two liquid layers and upper layer turned bluish green indicating the presence of glycosides.

Ansari, S. H. 2006. Essentials of pharnacognosy, 1st edition, Birla publications, New Delhi. pp. 357-359, 588-590.

Steroids (IP, 1996)

Salkowski Test: To 2 ml of extract, 2 ml of chloroform and 2 ml of conc. H2SO4 was added. The solution was shaken well. As a result chloroform layer turned red and acid layer showed greenish yellow fluorescence.

Indian Pharmacopoeia (IP). 1996. Govt. of India, Ministry of Health and Family Welfare Published by the Controller of Publications, New Delhi, A-47, A-53, A-54.

Alkaloids (Ansari, 2006)

The extract was evaporated in a test tube. To the residue dilute HCL was added, shaken well and filtered.

Mayer's Test: To the 2-3 ml of filtrate Mayer's reagent was added. Formation of yellow precipitate showed the presence of alkaloids.

Ansari, S. H. 2006. Essentials of pharnacognosy, 1st edition, Birla publications, New Delhi. pp. 357-359, 588-590.

Flavanoids (Kokate, 1994)

Shinoda Test:

To the extract, 5 ml of 95% ethanol and few drops of concentrated hydrochloric acid was added. To this solution 0.5 gm of magnesium turnings were added. Pink colouration indicated the presence of flavanoids.

Kokate, C. K. 1994. Practical Pharmacognosy, 4th edition, Vallabh Prakashan, New Delhi. 4 - 29.

Tannins (Mukherjee, 2002)

Lead Acetate Test: On addition of lead acetate solution to the extract white precipitate appeared.

Mukherjee, P. K. 2002. Quality control of herbal drugs, business horizons pharmaceutical publishers, New Delhi. 356 - 358.

Saponin (Ansari, 2006)

Foam Test: Drug extract was shaken vigorously with water. No persistent foam was formed.

Protein (Ansari, 2006)

Biuret test

With 3 ml of test solution, few drops of 4% NaOH and 1% CuSO4 solution were added. The tubes were observed for violet or pink colour formation.

Ansari, S. H. 2006. Essentials of pharnacognosy, 1st edition, Birla publications, New Delhi. pp. 357-359, 588-590.

Phenol (Mukherjee, 2002)

Ferric chloride test

The extract was diluted to 5 ml with distilled water. To that a few drop of neutral 5% ferric chloride solution was added. A dark green color indicates the presences of phenolic compounds.

Mukherjee, P. K. 2002. Quality control of herbal drugs, business horizons pharmaceutical publishers, New Delhi. 356 - 358.

Test for Glycosides (Horbone, 1984)

0.5 mg of extract was dissolved in 1 ml of water and then aqueous NaOH solution was added. Formation of yellow color indicates the presence of glycosides.

Horbone, J.B., In: Phytochemical methods, 2nd edition. Chapman and Hall, New York,1984.

Test for Triterepnoids (Horbone, 1984)

To the test solution 2ml chloroform was added with few drops of conc. Sulphuric acid (3ml) at the side of the test tube. An interface with a reddish brown coloration is formed if terpenoids constituent is present.

Horbone, J.B., In: Phytochemical methods, 2nd edition. Chapman and Hall, New York,1984.

QUANTITATIVE RESULT:

S.NO	QUANTITATIVE OF TEST	RESULT mg/g
1	CARBOHYDRATE	96 ± 0.43
2	ALKALOID	59 ± 0.61
3	SAPONIN	21 ± 0.64
4	TERPENOID	35 ± 0.41
5	PHENOL	49 ± 0.26

PROCEDURE

Quantitative Estimation of Alkaloids: (Evans, 1996)

To 1ml of Methanolic extract 5 ml pH 4.7 phosphate Buffer was added and 5 ml BCG solution and shake a mixture with 4 ml of chloroform. The extracts were collected in a 10-ml volumetric flask and then diluted to adjust volume with chloroform. The absorbance of the complex in chloroform was measured at 470 nm against blank prepared as above but without extract. Atropine is used as a standard material and compared the assay with Atropine equivalents.

Evans, W.C., 1966. Trease Evans Pharmacognosy., 14 th Ed, London: WB Saunders Ltd, 119- 159

Quantitative Estimation of carbohydrate

The total sugar content was estimated by Anthrone method (Roe, 1955). A known amount of the sample was taken, ground well with 80% ethanol and was centrifuged at 4000 rpm. From the supernatant, 0.5 ml was taken and 5 ml of anthrone reagent was added. The tubes were kept in a boiling water bath for 15 min. After that, they were kept in a dark room for another 15 minutes. The colour intensity developed was read in a spectrophotometer at 650 nm.

Ref: ROE, J. H. (1955), “The determination of sugar in blood and spinal fluid with anthrone reagent” Ibid., ill: 335-343.

Quantitative Estimation of Saponins: (Evans, 1996)

Methanolic and water extract was dissolved in 80% methanol, 2ml of Vanilin in ethanol was added, mixed well and the 2ml of 72% sulphuric acid solution was added,

mixed well and heated on a water bath at 600c for 10min, absorbance was measured at 544nm against reagent blank. Diosgeninis used as a standard material and compared the assay with Diosgenin equivalents.

Evans, W. C., Trease and Evans. 1996. Pharmacognosy 14th edition. W. B. Saunders company, London, 1996. Experts on Systemic Short-term and (Delayed) Neurotoxicity.

Quantitative Estimation of Phenolic Compounds: (Evans, 1996)

The total phenolics content in different solvent extracts was determined with the Folin- Ciocalteu's reagent (FCR). In the procedure, different concentrations of the extracts were mixed with 0.4 ml FCR (diluted 1:10 v/v). After 5 min 4 ml of sodium carbonate solution was added. The final volume of the tubes were made upto 10 ml with distilled water and allowed to stand for 90 min at room temperature. Absorbance of sample was measured against the blank at 750 nm using a spectrophotometer. A calibration curve was constructed using Gallic acid solutions as standard (0 to 250µg/µl).

Evans, W. C., Trease and Evans. 1996. Pharmacognosy 14th edition. W. B. Saunders company, London, 1996. Experts on Systemic Short-term and (Delayed) Neurotoxicity.

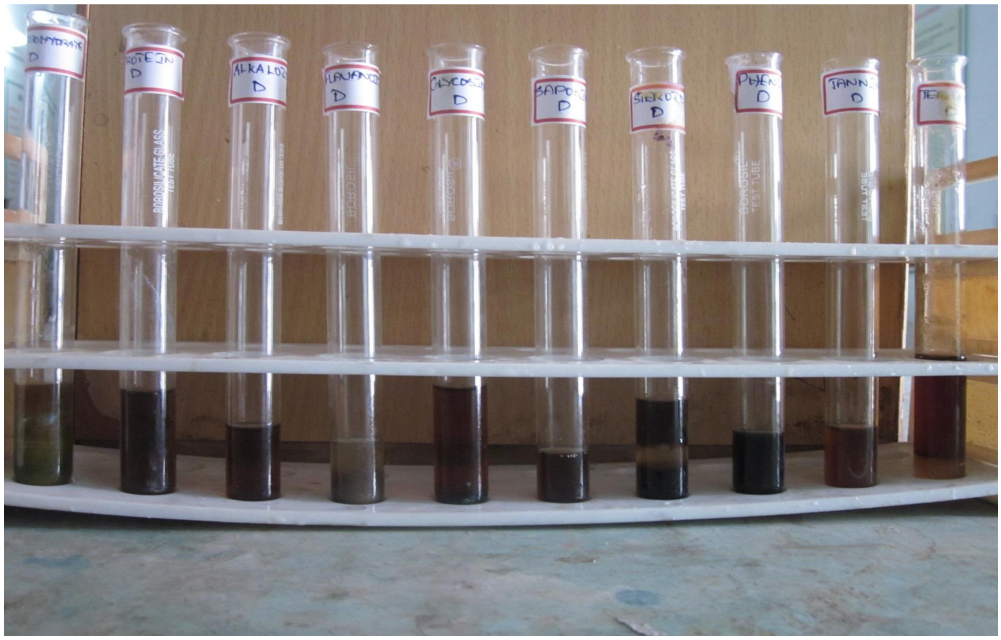
Total terpenoid determination

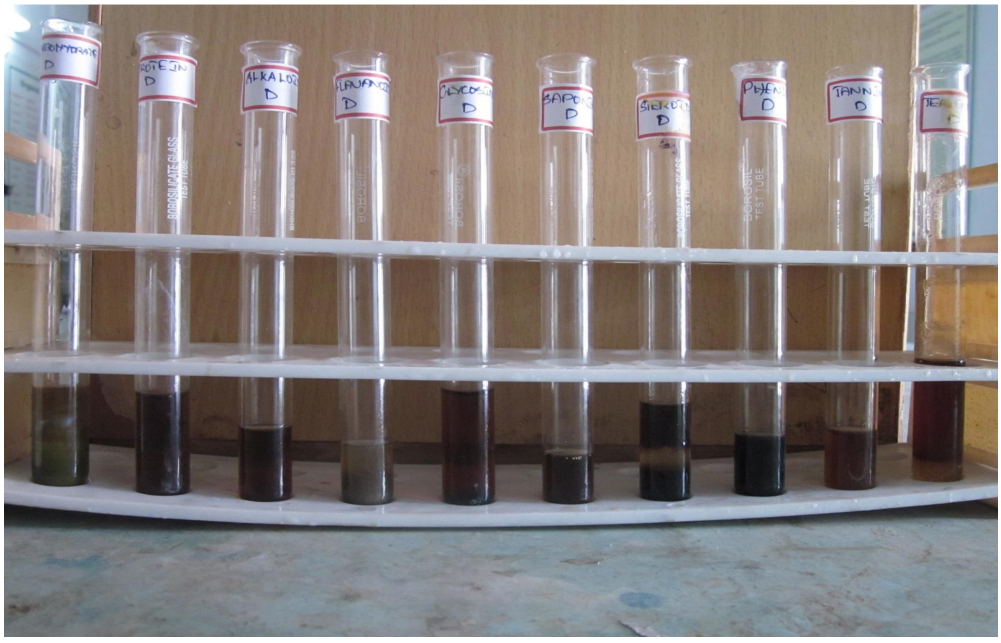
Total terpenoid content was determined by the method of Ghorai et al (2012). To 1 mL of the plant extract, 3 mL of chloroform was added. The sample mixture was thoroughly vortexed and left for 3 min and then 200 µl of concentrated sulfuric acid (H2SO4) was added. Then it was incubated at room temperature for 1.5h-2h in dark condition and during incubation a reddish brown precipitate was formed. Then carefully and gently, all supernatant of reaction mixture was decanted without disturbing the precipitation. 3 mL of 95% (v/v) methanol was added and www.ijppr.humanjournals.com Citation: Natesan Geetha et al. Ijppr.Human, 2015; Vol. 2 (2): 98-106. 102 vortexed thoroughly until all the precipitation dissolve in methanol completely. The absorbance was read at 538 nm using UV/visible

spectrophotometer. The total terpenoid content was calculated by calibration curve of Linalool and the results were expressed as Linalool equivalent (mg/g).

Ghorai N, Chakraborty S, Gucchait S, Saha, SK, Biswas S, Estimation of total Terpenoids concentration in plant tissues using a monoterpene, Linalool as standard reagent. Nature protocol Exchange, 2012.

PHYTO CHEMICAL ANALYSIS





ACUTE TOXICITY STUDY IN FEMALE WISTER RATS TO EVALUATE TOXICITY PROFILE OF SANTHUVATHA CHOORANAM WITH HOT WATER

Table1. Test substance details

NAME OF THE TEST SUBSTANCE	SANTHUVATHA CHOORANAM WITH HOT WATER
Colour of the test substance	BROWN
Nature of the test substance	Powder

Table 2. Experimental protocol

Name of the study	Acute toxicity
Guideline followed	OECD 423 method-acute toxic class method
Animals	Healthy young adult female wister rats, nulliparous, non-pregnant
Body weight	150-200 g
Sex	female
Administration of dose and volume	2000 mg/kg in 200g body weight, single dose in 1 ml
Number of groups and animals	5 groups and 3 animals in each group 100mg,250mg,500mg,1000mgand 2000mg/kg
Route of administration	Oral Cavage (po)
Vehicle	Hot Water

Table3. Housing and feeding conditions

Room temperature	22°C ± 3°C
Humidity	40-60%
Light	12 h : 12h (light : dark cycle)
Feed	Standard laboratory animal food pellets with water *ad libitum*

Table 4. Study period and observation parameters

Initial once observation	First 30 minutes and periodically 24 h
Special attention	First 1-4 h after drug administration
Long term observation	Upto 14 days
Direct observation parameters	Tremors, convulsions, salivation, diarrhea, lethargy, sleep and coma.
Additional observation parameters	Skin and fur, eyes and mucous membrane, respiratory, circulatory, autonomic and central nervous systems, somato motor activity and behavior pattern etc.

The time of death, if any, is recorded. (Complete observations: annexure I). After administration of the drug, food is withheld for a further 1-2 hours.

Study procedure

Acute oral toxicity was performed as per organization for economic co-operation for development (OECD) guideline 423 method. The SANTHUVATHA CHOORANAM WITH HOT WATER was administered in a single dose by tuberculin syringe. Animals are fasted 3 h prior to dosing (food was withheld for 3 h but not water). Following the period of fasting animals was weighed and test substance was administered orally at a dose of 100mg,250mg,500mg,1000mgand 2000mg/kg. After the SANTHUVATHA CHOORANAM WITH HOT WATER administration, food was withheld 2 h in mice. Animals are observed individually after at least once during the first 30 minutes, periodically during the first 24 hrs, with special attention given during the first 4 hrs, and daily thereafter, for a total of 14 days.

REPORT

Toxicological evaluation of SANTHUVATHA CHOORANAM WITH HOT WATER

Table:5 Effect of SANTHUVATHA CHOORANAM WITH HOT WATER on acute toxicity test in female rats.

S.NO	RESPONSE	HEAD		BODY		TAIL	
		BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER
1	Alertness	Normal	Normal	Normal	Normal	Normal	Normal
2	Grooming	Absent	Absent	Absent	Absent	Absent	Absent
3	Touch response	Absent	Absent	Absent	Absent	Absent	Absent
4	Torch response	Normal	Normal	Normal	Normal	Normal	Normal
5	Pain response	Normal	Normal	Normal	Normal	Normal	Normal
6	Tremors	Absent	Absent	Absent	Absent	Absent	Absent
7	Convulsion	Absent	Absent	Absent	Absent	Absent	Absent
8	Righting reflux	Normal	Normal	Normal	Normal	Normal	Normal
9	Gripping strength	Normal	Normal	Normal	Normal	Normal	Normal
10	Pinna reflux	Present	Present	Present	Present	Present	Present
11	Corneal reflux	Present	Present	Present	Present	Present	Present
12	Writhing	Absent	Absent	Absent	Absent	Absent	Absent
13	Pupils	Normal	Normal	Normal	Normal	Normal	Normal
14	Urination	Normal	Normal	Normal	Normal	Normal	Normal
15	Salivation	Normal	Normal	Normal	Normal	Normal	Normal
16	Skin colour	Normal	Normal	Normal	Normal	Normal	Normal
17	Lacrimation	Normal	Normal	Normal	Normal	Normal	Normal

RESULT:

From acute toxicity study it was observed that the administration of SANTHUVATHA CHOORANAM WITH HOT WATER to Female Wister rats did not induce drug-related toxicity and mortality in the animals up to 2000mg/kg in 200g female Wister rats. So No-Observed-Adverse-Effect- Level (NOAEL) of SANTHUVATHA CHOORANAM WITH HOT WATER is 2000 mg/kg equal to human dose

DISCUSSION

SANTHUVATHA CHOORANAM WITH HOT WATER was administered single time at the doses of 100mg, 250mg, 500mg, 1000mg and 2000mg/kg to female Wister rats and observed for consecutive 14 days after administration. Doses were selected based on the pilot study and literature review. All animals were observed daily once for any abnormal clinical signs. Weekly body weight and food consumption were recorded. No mortality was observed during the entire period of the study. Data obtained in this study indicated no significance physical and behavioral signs of any toxicity due to administration of SANTHUVATHA CHOORANAM WITH HOT WATER at the doses of 100 mg, 250mg ,500mg, 1000mg and 2000mg/kg to female Wister rats

At the 14th day, all animals were observed for functional and behavioral examination. In functional and behavioral examination, home cage activity, hand held activity were observed. Home cage activities like Body position, Respiration, Clonic involuntary movement, Tonic involuntary movement, Palpebral closure, Approach response, Touch response, Pinna reflex, Sound responses, Tail pinch response were observed. Handheld activities like Reactivity, Handling, Palpebral closure, Lacrimation, Salivation, Piloercetion, Papillary reflex, abdominal tone, Limb tone were observed. Functional and behavioral examination was normal in all treated groups. Food consumption of all treated animals was found normal as compared to normal group.

SUMMARY & CONCLUSION

Summary:

The present study was conducted to know single dose toxicity of SANTHUVATHA CHOORANAM WITH HOT WATER on female Wister rats. The study was conducted using 15 female Wister rats. The female animals were selected for study of 8- 12 weeks old with weight range of within ± 20 % of mean body weight at the time of randomization. The groups were numbered as group I, II, III, IV and V and dose with 100mg, 250mg, 500mg, 1000mg and 2000mg/kg of SANTHUVATHA CHOORANAM WITH HOT WATER. The drug was administered by oral route single time and observed for 14 days. Daily the animals were observed for clinical signs and mortality.

14 There were no physical and behavioral changes observed in Female Wister rats during days. Mortality was not observed in any treatment groups.

Conclusion:

The study shows that SANTHUVATHA CHOORANAM WITH HOT WATER did not produce any toxic effect at dose of 100mg, 250mg, 500mg, 1000mg and 2000mg/kg to rats. So No-Observed-Adverse-Effect-Level (NOAEL) of SANTHUVATHA CHOORANAM WITH HOT WATER is 2000 mg/kg.

7.0 ABBREVIATIONS

No Number

Mg Milligram

Kg Kilogram

LD50 LethalDose 50

p.o peros

ML Milliliter

% percentage

R&D Research and Development

g% Gram percentage

g Gram

NOAEL No-Observed-Adverse-Effect-Level

MLD Minimum Lethal Dose

MTD Maximum Tolerated Dose

OECD Organisation of Economic Co-operation and Development

CPCSEA Committee for the Purpose of Control and Supervision of Experiments on Animals

8.0 REFERENCES:

OECD. Guideline for Testing of Chemicals 423, Acute oral toxicity (acute toxic class method). December 2001.

SUB-ACUTE TOXICITY STUDY IN WISTER RATS TO EVALUATE TOXICITY PROFILE OF SANTHUVATHA CHOORANAM WITH HOT WATER

Objective

The objective of this study is to evaluate the toxic effects, if any, as a result of the repeated once daily oral administration of SANTHUVATHA CHOORANAM WITH HOT WATER to Wister Albino rats for a minimum period of 28 consecutive days. This study will provide information on any major toxic effects, target organs and a rationale for concluding the No-Observed-Adverse-Effect-Level (NOAEL) and/or No Observed Effect Level (NOEL) / LOEL (Low Observed Effect Level) and risk assessment in humans.

This study plan is prepared as per the following guidelines:

1. Test Guidelines

Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

OECD – 407 – Repeated dose 28-day Oral Toxicity Study in Rodents, Adopted 3 October, 2008.

1.1. Test System Details

Species	:	Rat
Strain	:	Wister Albino
Source	:	Sree Venkateshwara Enterprises Pvt Ltd, Bangalore
Age	:	6-8 weeks
Sex	:	Male / Female (nulliparous and non-pregnant)
Body weight	:	160.0 to 180.0 g

1.2. Acclimatization

Animals will be allowed to acclimatize to the experimental room conditions for five days prior to the commencement of dosing. During the acclimatization period, the animals will be observed daily for any apparent adverse clinical signs. Prior to assignment to the study and commencement of treatment, a detailed physical health examination will be performed on all animals by a veterinarian and animals with any evidence of ill health or poor physical condition will not selected for the study.

1.3. Randomization and Grouping

On the starting day of dosing, the animals will be weighed and health examination will be performed by veterinarian. Animals will be randomly allocated to different

groups according to their body weight by using MS-Excel sheet as described in the randomization SOP. Animals will be divided into four groups (vehicle control, low, intermediate, and high dose). At the initiation of the treatment, the body weight variation between the groups did not exceed ±20% of the mean weight of each sex.

1.4. Animal Identification

In each cage, animals will be identified with numbers by marking at the base of the ear. The cages will be identified with an attached colored cage label showing study number, study code, group number, sex, dose, strain, species, cage number, route of administration and animal number.

2. Animal Husbandry

2.1. Animal Welfare and approval

The study was approved by the IAEC (SLS) and Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA registration number: Abc14).Their recommendations regarding animal care and handling will be followed.

2.2. Environmental Conditions

The temperature of the experimental room will be maintained at 22±3^{0}Cand the relative humidity between 30-70 %. The photoperiod will be 12 hours light and 12 hours dark cycles

2.3. Housing Conditions

Two animals will be housed in autoclaved polypropylene rat cages (Size in mm=L x W x H: 430 x 290 x 160) using paddy husk as the bedding material. Each cage will be fitted with a top grill having provision for keeping rodent pellet feed and an autoclaved polypropylene water bottle with stainless steel drinking nozzle. Cages will be placed on 3-tier racks and cage rotation will be performed every week. Cages will be changed at least twice a week. The cages and water bottles will be cleaned and autoclave sterilized.

2.4. Sanitation

Each day, the floor of the animal room will be swept and mopped. Cages and bedding material will be changed once in three days and water bottles will be changed daily. All the experimental procedures will be done in a clean environment.

2.5. Feed

The experimental animals will be provided with irradiated rodent pellet feed *ad libitum* supplied from Sai feeds Pvt ltd, Chennai . Feed will be withheld for four hours prior to blood collection and necropsy.

2.6. Drinking Water

Animals will be provided with filtered drinking water *ad libitum* passed through water filter system (Aquaguard™) in autoclaved polypropylene bottles. Water bottles will be changed daily. Microbial analysis of water will be carried out once monthly and the report is maintained in the study file.

3. Personnel Safety

All personnel handling animals undergo regular medical examination. Protective clothing like apron, face mask, head cap, and gloves will be used to maintain hygienic conditions.

4. Materials and Methods

4.1. Preparation of Dose formulation

The dose formulation will be prepared under aseptic conditions as per SLS, SOP.

4.2. Route of Administration and Justification

Administration will be by oral gavage, as it is one of the possible routes of exposure.

4.3. Frequency and Duration of Administration

Once daily for 28 consecutive days

4.4. Dosing Procedure

The test item will be administered in once daily by oral gavage using a suitable intubation cannula fitted with a graduated syringe. The scheme of dosing and sacrifice time points are presented in the below below Table.

4.5. Experimental Procedures

All experimental procedures will be performed in accordance with the Study plan and Standard Operating Procedures (SOPs) of SLS.

CONVERSION FORMULA:

Human dose is 1000 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 150 gm of Rat

1000 mg x 2(a) x 0.018 (b) = 18 (c) /150 gm of Rat

18/1000x150 = 2.7 mg

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	--	1 ml
2	Therapeutic Dose	2.7 mg /kg	1 ml
3	Middle Dose	13.5mg/kg	1 ml
4	High Dose	67.5mg/kg	1 ml

Experimental Design

Group No.	Group	Dose (mg/kg b.wt /day)	No. of Animals	
			Male	Female
G1	Vehicle control	**HOT WATER**	5	5
G2	Low dose of **SANTHUVATHA CHOORANAM WITH HOT WATER**	2.7mg/kg	5	5
G3	Intermediate dose **SANTHUVATHA CHOORANAM WITH HOT WATER**	13.5mg/kg	5	5
G4	High dose **SANTHUVATHA CHOORANAM WITH HOT WATER**	67.5mg/kg	5	5

5. Observations

Animals will be observed daily throughout the treatment period at regular intervals. During the treatment period, animals will be observed twice daily for any clinical signs of toxicity, morbidity and mortality. All the surviving animals will be sacrificed at the end of scheduled period and subjected to gross necropsy and histopathological evaluations.

5.1. Clinical Signs

All the animals will be subjected to cage-side (home-cage) observations twice a day for any clinical signs of toxicity, preferably at the same time each day and considering the peak period of anticipated effect. In addition to home cage observations, a detailed

clinical examination will be performed once prior to dosing and weekly thereafter during treatment period.

5.2. Morbidity/ Mortality

All animals will be examined twice a day for mortality and signs of morbidity.

5.3. Body Weights

Body weights will be recorded at the beginning of acclimatization, before randomization, there after at weekly intervals and at the time of necropsy.

5.4. Feed Consumption

Feed consumption will be calculated on a weekly basis throughout the study period.

5.5. Haematology and Clinical Biochemistry

Hematology and clinical biochemistry tests will be performed with terminally collected blood samples on day-29 from all animals. Animals will be deprived of feed overnight and blood samples will be collected by tapping the ear for visibility of the vein site and inserted the needle into the marginal ear vein and collected the blood into micro centrifuge tube. Approximately 0.5 ml of blood will be collected in vials containing 1% EDTA (20µl) as an anticoagulant for hematological analysis.

Approximately 2 ml blood will be collected from each animal in micro centrifuge tubes containing 15µl of heparin (19 units) and the plasma will be separated by centrifugation at 4000 rpm for ten minutes at 4^{o}C. The plasma will be stored at -20 ^{o}C ± 2 and used for all clinical chemistry analysis.

5.6. Hematology

Erythrocyte count (RBC), Total Leucocyte count (WBC), Hemoglobin (Hb), Hematocrit (HCT), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC) and Platelet (PLTC).

5.7. Clinical Biochemistry

Glucose, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline phosphatase (ALP), Total protein, Albumin, Creatinine, Urea, Cholesterol, Triglycerides, Sodium, Potassium, Calcium, and Chloride.

5.8 Pathology

All animals will be euthanized by CO_2 asphyxiation and subjected to necropsy under the supervision of the veterinary pathologist. Different tissues/organs of thoracic, abdominal and cranial cavities will be examined for any gross pathological changes. Tissues from vehicle control and high dose groups will be subjected to detailed

histopathological analysis (Ovaries/ testes, kidneys, liver, lungs). The organs will be fixed using Bouin's (reproductive organs) and 10% neutral buffered formalin (kidneys, liver, spleen, lungs).Processing of tissue will be done by spin tissue processer, embedding of the tissue by tissue embedder. The tissues will be initially trimmed to 10-20µ thickness and later 3-6µ to obtain thinner tissue sections by using rotary microtome. Haematoxylin and Eosin staining will be performed for all tissues.

5.8. Organ Weights

Absolute weights of adrenal glands, brain, ovaries/testes, epididymis/uterus, heart, kidneys, liver, spleen and lungs will be recorded for all the animals after trimming adherent tissue immediately after dissection from the animal. Paired organs will be weighed together. Relative weights of these organs against fasting animal body weights will be calculated and reported.

6. Data Compilation

Data will be summarised in a tabular form showing the number of animals, experimental design, dose groups, dose volume and concentrations, test item and vehicle control details. All findings like clinical signs, mortality and morbidity data, time of death, body weights, feed consumption, clinical signs, and necropsy and pathology observations will be recorded and given in the final report. One original copy of the final report is issued to the sponsor.

7. Statistical Analysis

All the parameters of treated groups of both sex, viz. body weight, feed consumption, organ weights (absolute and relative), biochemical parameters, and hematology parameters will be analyzed using SPSS software, version 16.0 by using one-way ANOVA test with multiple comparison (vehicle controls treated groups) in the study report, and p value < 0.05 is considered as statistically significant.

8. References

1. Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines for Laboratory Animal Facility, The Gazette of India, 1998.

2. Hayes AW, 2000. Principles and Methods of Toxicology, 4th ed., Taylor and Francis, London.

3. Karl-Heinz Diehl, R. H. (2001). A Good Practice Guide to the Administration of Substances and Removal of Blood, Including Routes and Volumes. journal of applied toxicology , 15-23.

4. OECD – 407 - Repeated dose 28-day oral Toxicity Study in Rodents, Adopted October 3, 2008.

5. Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

MATERIALS AND METHODS

ESTIMATION OF HEMATOLOGICAL PARAMETERS: [1]

Collection of blood for hematological studies

After the treatment period the animals were anaesthetized by ketamine hydrochloride and the blood was collected from Retro-orbital sinus by using capillary into a centrifugation tube which contains EDTA for haematological parameters The haematological parameters like RBC, WBC and Hb percentage, Differential cell count, MCV, MCHC, Hematocrit, MCH, platelet count were estimated by the following procedures.

1. ENUMERATION OF RED BLOOD CELLS: [1]Ramnic 2007)

Reagents : RBC diluting fluid

Procedure:

Using a red blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and RBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried. Using 45X or high power objective the RBC's were counted uniformly in the larger corner squares. The cells were expressed as number of cells $x10^{12}$/l

2. ENUMERATION OF WBC: [2] ***John 1972)***

Reagents:

Turk's fluid: Turk's fluid was prepared by mixing 2ml of acetic acid with 100 ml of distilled water. To this 10 drop of aqueous methylene blue 3 % w/v) was added. This solution haemolysis the red cells due to acidity so that counting of white cells becomes easy.

Procedure:

Using a white blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and WBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried.

Using 10X or low power objective the WBC's were counted uniformly in the larger corner squares.

The cells were expressed as number of cells/10mm.

3. DIFFERENTIAL LEUCOCYTE COUNT: [3] John 1972)

Reagent:

Leishmann's stain: 150mg of powdered leishmann's stain was dissolved in 133ml of acetone free methanol.

Procedure:

A blood film stained with leishmann's stain was examined under oil immersion and the different types of WBCs were identified. The percentage distribution of these cells was then determined. Smears were made from anticoagulant blood specimens and stained with leishmann's stain. The slides were preserved for counting the number of lymphocytes and neutrophils, per 100 cells were noted.

From the different Leukocyte count and WBC count, absolute lymphocyte and neutrophil count were calculated.

$$\text{Absolute neutrophil count} = \frac{\text{Number of neutrophils}}{100} \times \text{TWBC}$$

$$\text{Absolute lymphocyte count} = \frac{\text{Number of lymphocytes}}{100} \times \text{TWBC}$$

DETERMINATION OF BIOCHEMICAL PARAMETERS:

For assessment of biochemical parameters, blood samples were collected from the animals by puncturing the retro-orbital plexus and centrifuged. The serum collected after centrifugation was analyzed for various biochemical parameters like SGOT, SGPT, ALP,TC.TG,HDL All of the above biochemical parameters were estimated using semi autoanalyzer (Photometer 5010 $_{V5+}$, Germany) with enzymatic kits procured from Piramal Healthcare limited, Lab Diagnostic Division, Mumbai, India.

1. Total Cholesterol (TC)

Principle

Determination of cholesterol is done after enzymatic hydrolysis and oxidation. The colorimetric indicator is quinoneimine, which is generated from 4-aminoantipyrine and phenol by hydrogen peroxide under the catalytic action of peroxidase (trinder's reaction).

Cholesterol ester + H_2O $\xrightarrow{CHE}$ Cholesterol + Fatty acid

Cholesterol + O_2 $\xrightarrow{CHO}$ Cholesterol-3-one +H_2O_2

$2H_2O_2$ + 4- Amino antipyrine + Phenol $\xrightarrow{POD}$ Quinonelimine + 4 H_2O_2

Method

CHOD-PAP: Enzymatic photometric test

Table 6: Reagents

Goods buffer (pH 6.7)	50 mmol/ l
Phenol	5 mmol/l
4-aminoantipyrine	0.3 mmol/l
Cholesterol estrase	> 200 U/l
Cholesterol oxidase	> 100 U/l
Peroxidase	3 KU/l
Standard	(5.2 mmol/l)

Assay procedure

1. 1 ml (1000 µl) of reagent-1 is taken in a 5 ml test tube.
2. Added 0.01 ml (10 µl) of serum.
3. Mixed well and incubated at 37°C for 5 min.
4. Read the test sample.

NORMAL RANGE: <200 mg/dl in serum.

1. Deeg R, Ziegenhorn J, Kinetic enzymatic method for automated determination of total cholesterol in serum, Clin. Chem., 1983, 29:1798-802.

2. Triglycerides

Principle

Determination of triglycerides (TG) alters enzymatic splitting with lipoprotein lipase. Indicator is quinoneimine which is generated from 4-aminoantipyrine and 4-chlorophenol by hydrogen peroxidase under the catalytic action of peroxidase.

Triglycerides $\xrightarrow{LPL}$ Glycerol + fatty acid

Glycerol + ATP $\xrightarrow{GK}$ Glycerol-3-phosphate+ ADP

Glycerol-3-phosphate $+O_2 \xrightarrow{GPO}$ Dihydroxyaceton phosphate + H_2O_2

$2H_2O_2$ + 4- Amino antipyrine + 4- chlorophenol $\xrightarrow{POD}$ Quinonelimine + HCL + $4H_2O_2$

Method

Colorimetric enzymatic test using glycerol-3-phosphate-oxidase (GPO).

Reagents

Components and concentrations in the test Goods buffer pH 7.2, 50 mmol/ l

Table 7: Reagents

4-chloroPhenol	4 mmol/l
ATP	2 mmol/l
Mg^{2+}	15 mmol/l
Glycerokinase	> 0.4 Kμ/l
Peroxidase	> 2 Kμ/l
Lipoprotein lipase	> 4 Kμ/l
4-aminoantipyrine	0.5 mmol/l
Glcerol-3-phosphate- oxidase	> 1.5Kμ/l
Standard	(2.3 mmol/l)

Assay procedure

a. 1 ml (1000 μl) of reagent-1 is taken in a 5 ml test tube.

b. Added 0.01 ml (10 μl) of serum.

c. Mixed well and incubated at 37°C for 15 min.

d. Read the test sample.

Normal Range: <200 mg/dl in serum.

Cole T.G, Klotzsch S.G, Mcnarmara J, Measurement of triglyceride concentration, In Rifai N, Warnick G.R, Dominiczak M.H, Handbook of lipoprotein testing, Washington:AACC, Press, 1997, 115-26.

3. HDL Cholestrol

Principle

Chylomicrons, VLDL and LDL are precipitated by adding phosphotungstic acid and magnesium ions to the sample. Centrifugation leaves only the HDL in the supernatant. The cholesterol content in it is determined enzymatically.

Method

Phosphotungstic acid precipitation method.

Table 8: Reagents

Phosphotungstic acid	0.55 mmol/l
Magnesium chloride	25 mmol/l

Assay procedure

A. Preparation of supernatant for the HDL-CHL estimation

Added 200 µl of serum to the 500 µl of HDL-Cholesterol precipitating reagent (from HDL kit) in 1.5 ml centrifuge tube and mixed well. Centrifuged the above solution at 4000 rpm for 10 min.

B. Preparation of test sample for the estimation of HDL-Cholesterol

a. Taken 1000 µl of reagent-1 (from cholesterol kit) in a 5 ml test tube.

b. Added, 100 µl of supernatant from above centrifuged solution

c. Mixed well and incubated at 37°C for 15 min.

d. Read the test sample.

Normal Range: >60 mg/dl in serum.

1. Friedewald W.T, Levy R.T, Frederickson D.S, Estimation of VLDL and LDL cholesterol, Clin. Chem., 1972, 18:499-502.

4. ESTIMATION OF SERUM GLUTAMATE PYRUVATE TRANSAMINASES (SGPT/ ALT)

1. Determination of aspartate aminotransferase (AST)

Aspartate aminotransferase, also known as Glutamate Oxaloacetate Transaminase (GOT)catalyses the transamination of L-aspartate and α keto glutarate to form oxaloacetate and L- glutamate. Oxaloacetate formed is coupled with 2,4-

Dinitrophenyl hydrazine to form hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered aspartate (pH 7.4); 2,4- DNPH reagent; 4N sodium hydroxide; working pyruvate standard; solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was adopted for the estimation of SGOT. (Reitmann S, Frankel S, 1957. A colorimetric method for the determination of serum oxaloacetic and glutamic pyruvate transminases. American Journal of Clinical Pathology.28: 56-63.The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered aspartate was added into all the test tubes. Then 0.05 ml of serum was added to the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 min, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution I was added to all test tubes. Mixed properly and optical density was measured in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:-

AST (GOT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)/ (Absorbance of standard - Absorbance of blank)] x concentration of the standard

2. Determination of alanine aminotransferase(ALT)

Alanine aminotransferase, also known as Glutathione Peroxidase (GPT) catalyses the transamination of L-alanine and α keto glutarate to form pyruvate and L-Glutamate. Pyruvate so formed is coupled with 2,4 – Dinitrophenyl hydrazine to form a corresponding hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered alanine (pH 7.4), 2,4–DNPH, 4N sodium hydroxide, working pyruvate standard, solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was dopted for the estimation of SGPT. The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered alanine was added into all the test tubes. This was followed by the addition of 0.05 ml of serum into the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 minutes, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution **I** was added to all test tubes. Mixed properly and optical density was read against purified water in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:- ALT (GPT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)/ (Absorbance of standard - Absorbance of blank)] x concentration of the standard.

3. Determination of alkaline phosphatase (ALP)

Alkaline phoshatase from serum converts phenyl phosphate to inorganic phosphate and phenol at pH 10.0. Phenol so formed reacts in alkaline medium with 4-aminoantipyrine in presence of the oxidising agent potassium ferricyanide and forms an orange-red coloured complex, which can be measured spectrometrically. The color intensity is proportional to the enzyme activity.

Reagents:

Buffered substrate

Chromogen Reagent

Phenol Standard, 10 mg%

Procedure:

ALP was determined using the method of Kind (Kind PRM, King EJ, 1972. *In-vitro* determination of serum alkaline phosphatase. Journal of Clinical Pathology 7: 321-22\). The working solution was prepared by reconstituting one vial of buffered substrate with 2.2 ml of water. 0.5 ml of working buffered substrate and 1.5 ml of purified water was dispensed to blank, standard, control and test. Mixed well and incubated at 37^{0}C for 3 min. 0.05 ml each of serum and phenol standard were added to test and standard test tubes respectively. Mixed well and incubated for 15 min at

37^0C. Thereafter, 1 ml of chromogen reagent was added to all the test tubes. Then, added 0.05 ml of serum to control. Mixed well after addition of each reagent and the O.D of blank, standard, control and test were read against purified water at 510 nm.

Serum alkaline phosphatase activity in KA units was calculated as follows

[(O.D. Test-O.D. Control) / (O.D. Standard- O.D. Blank)] x 10

4. Determination of bilirubin

In toxic liver, bilirubin levels are elevated. Hyperbilirubinemia can result from impaired hepatic uptake of unconjugated bilirubin, such a situation can occur in generalized liver cell injury, certain drugs (e.g Rifampin and probenecid) interfere with the rat uptake of bilirubin by the liver cell and may produce a mild unconjugated hyperbilirubinemia. Bilirubin level rises in diseases of hepatocytes, obstruction to bilirubin excretion into duodenum, in haemolysis and defects of hepatic uptake and conjugation of Bilirubin pigment such as Gilbert's disease.

Elevation of total serum bilirubin may occur due to:

1.Excessive haemolysis or destruction of the red blood cells.Eg:Haemolytic disease of the new born.

2.Liver diseases.Eg.Hepatitis and cirrhosis.

3.Obstruction of the biliary tract.Eg.Gall stones.

The method is based on the reaction of Sulfonilic acid with sodium nitrite to form azobilirubin which has maximum absorbance at 546nm in the aqueous solution. The intensity of the color Produced is directly proportional to the amount of direct or total bilurubin concentration present in the sample.

Reagents

1. Diazo A-(Reagent-R1) :Ready to use
2. Diazo B-(Reagent-R2):Ready to use
3. Bilirubin Activater :Ready to use

Procedure

Kind & King's method was followed for the estimation of Bilirubin. Five hundred µl of working reagent was added to 50 µl of rat serum & incubated for 5 min at 37°C. Absorbance was measured AT 546 NM in semi auto analyzer against the standard.

The Bilirubin content was calculated using the following equation:

Total bilirubin (mg/dt) = Abs of the sample blank x 15.

Direct Bilirubin(mg/dt) = Abs of sample blank x 10.

5. ESTIMATION OF UREA

Urea is the nitrogen-containing end product of protein catabolism. States associated with elevated levels of urea in blood are referred to as hyper uremia or azotemia.

Method

Estimation of urea was done by Urease-GLDH: enzymatic UV test.

Principle

$Urea + 2H_2O \xrightarrow{Urease} 2NH_4 + 2HCO_3$

$2\text{- Oxoglutarate} + NH_4^+ + NADH \xrightarrow{GLDH} L\text{- Glutamate} + NAD^+ + H_2O$

Table 14. Reagents

R 1	TRIS pH 7.8	120 mmol/l
	2-Oxoglutarate	7 mmol/l
	ADP	0.6 mmol/l
	Urease	≥ 6 KU/l
	GLDH	≥ 1 KU/l
R 2	NADH	0.25 mmol
R 3	Standard	40 mg/dl

Procedure

a. Take 1000 µl of reagent-1 and 250 µl of reagent-2 in 5 ml test tube.

b. To this, add 10 µl of serum.

c. Mix well and immediately read the test sample at 340 nm Hg 334 nm Hg 365 nm optical path 1 cm against reagent blank (2-point kinetic).

d. And note down the value.

Normal range: 10 – 50 mg/dl.

6. ESTIMATION OF URIC ACID

Uric acid and its salts are end products of the purine metabolism. In gout the most common complication of hyperuricemia, ie. Increased serum levels of uric acid lead to formation of monosodium urate crystal around the joints.

Method

Enzymatic photometric test using TOOS (N ethyl- N (hydroxyl -3- sulfopropyl)-m-toluidin)

Principle

$Uric\ acid + H_2O + O_2 \xrightarrow{uricase} Allantoin + CO_2 + H_2O_2$

TOOS + 4 aminoantipyrine + $2H_2O_2$ $\xrightarrow{POD}$ Indamine + $3H_2O$

Table 15.reagents

R1	Phosphate buffer pH 7.0	100mmol/l
	TOOS	1mmol/l
	Ascorbate oxidase	≥1 KU/l
R2	Phosphate buffer pH 7.0	100mmol/l
	4- amino antipyrine	0.3mmol/l
	K_4 (Fe(CN)$_6$)	10µmol/l
	Peroxidase	≥1KU/l
	Uricase	≥50U/l

Procedure

a. Take 800µl of reagents -1 in a2ml centrifuge tube.

b. To this add 20µl of serum.

c. Mix well and incubate at 30°c for 5 minutes.

d. Then add 200µl of reagent2

e. Mix well incubate for 5min at 37°c

f. Measure the not down the values.

Normal range: 1.9-8.2mg/dl

7. ESTIMATION OF CREATININE:

Principle:

Creatinine forms a coloured complex with picrate in alkaline medium.

The rate of formation of the complex is measured.

Reagents:

Reagent 1 Standard Creatinine (2mg/100ml)

Reagent 2 Picric acid solution.

Reagent 3 sodium hydroxide solution

Procedure:

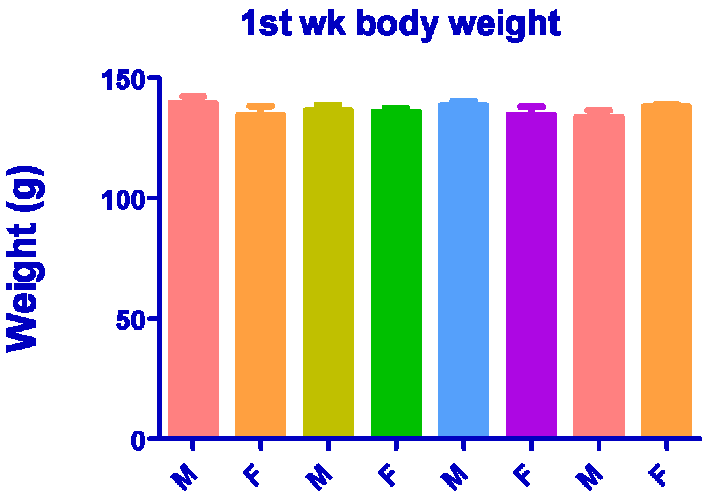
Take 500 µl of reagent -2 and 500 µl of reagent -3 in a 5ml test tube. To this add 100 µl of serum. Mix well and immediately read the test sample at Hg 492 nm 1cm light path and note down the values.

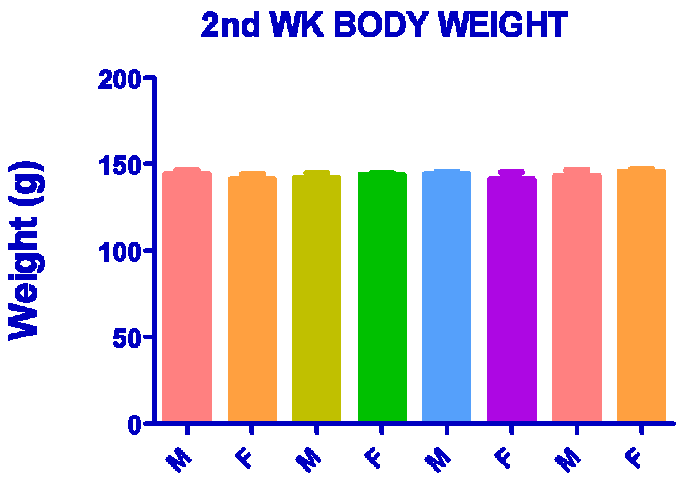
Normal range is 0.6 -1.1 mg/dl.

TABLE: 1 EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF SANTHUVATHA CHOORANAM WITH HOT WATER ON BODY WEIGHT IN Gram (PHYSICAL PARAMETER)

GPs	Control		Low Dose		Middle Dose		High Dose	
	Male	Female	Male	Female	Male	Female	Male	Female
1st wk	139.7± 2.728	134.7± 3.712	136.7± 2.404	136± 1.732	138.7± 1.764	134.7± 3.528	134± 2.646	138± 1.155
2nd wk	144.3± 2.028	141±3	142.3± 2.667	143.7± 1.202	144± 1.732	141± 4.359	143.3± 3.283	145.7± 1.453
3rd wk	152.7± 2.028	150± 2.646	153.3± 3.283	155.3± 2.028	157.3± 1.202	153± 2.646	153± 2.517	158.7± 2.028
4th wk	169.3± 1.333	163.7± 2.906	164.3± 2.728	167.3±2. 028	167.3±0. 8819	164.3± 2.728	164.3± 2.728	169± 3.786

Values are expressed as the mean ± S.D

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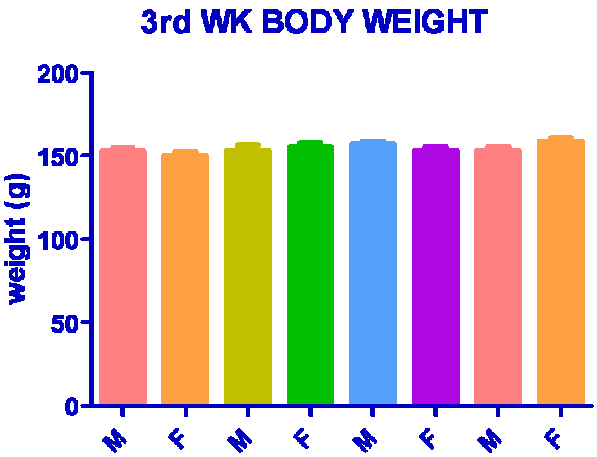
Weight (g)
200
150
100
50
0
M
F
M
F
M
F
M
F


3rd WK BODY WEIGHT
weight (g)
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150
100
50
0
M
F
M
F
M
F
M
F

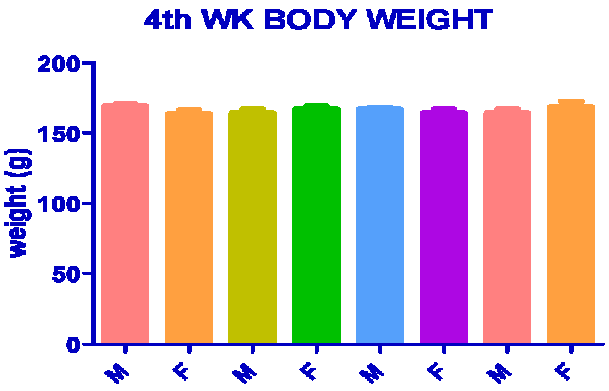

4th WK BODY WEIGHT
weight (g)
200
150
100
50
0
M
F
M
F
M
F
M
F

TABLE: 2EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF SANTHUVATHA CHOORANAM WITH HOT WATER ON FOOD INTAKE IN Gram (PHYSICAL PARAMETER)

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	68	54	42	34	78	46	64	30
DAY2	64	40	80	55	44	88	80	34
DAY3	56	64	42	56	64	52	46	58
Day 4	58	68	45	32	38	56	80	56
DAY5	61	88	36	58	34	24	74	62
Day 6	62	48	54	60	38	62	56	64
DAY7	54	78	72	56	38	44	57	74
DAY8	72	56	38	19	54	50	16	74
Day 9	56	28	48	36	64	71	82	56
DAY10	56	77	56	78	54	42	56	80
Day 11	56	74	56	78	64	58	44	56
DAY12	62	54	45	52	34	56	72	64
DAY13	64	58	50	48	62	56	88	64
Day 14	72	34	16	35	20	75	35	56
DAY15	58	62	32	44	18	40	26	64
Day 16	56	64	80	56	22	60	48	56
DAY17	24	58	74	62	45	56	64	74
DAY18	70	56	44	54	68	58	30	62
Day 19	39	24	34	28	30	39	25	60

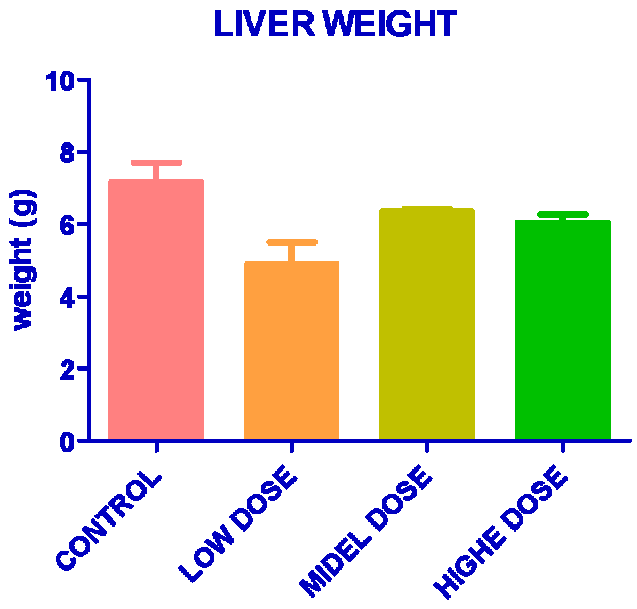
DAY20	56	58	38	62	56	31	28	80
DAY21	34	14	38	30	44	52	66	32
Day 22	42	22	56	18	34	24	18	22
DAY23	38	26	34	10	18	6	44	58
DAY24	58	64	60	12	58	68	32	38
Day 25	62	74	50	14	61	88	58	34
DAY26	58	62	32	44	18	40	26	64
DAY27	56	64	80	56	22	60	48	56
DAY28	24	58	74	62	45	56	64	74

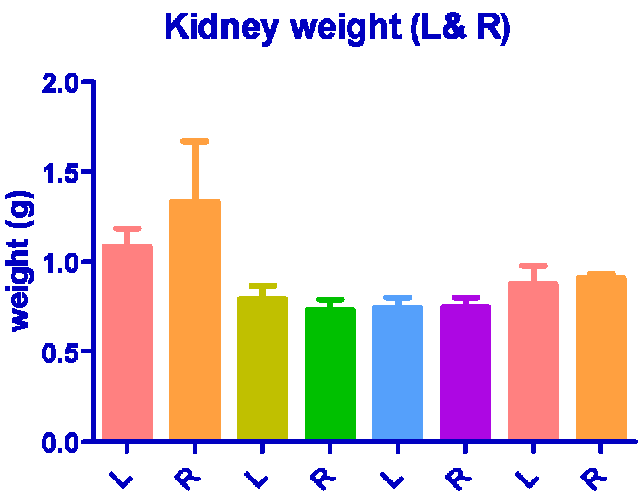
Values are expressed as the mean ± S.D
Values are expressed as the mean ± S.D

EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF SANTHUVATHA CHOORANAM WITH HOT WATER ON ORGAN WEIGHT in gm

GROUP		CONTROL	Low Dose	Middle Dose	High Dose
LIVER WEIGHT		7.168±0.54	4.896±0.598	6.343±0.088	6.039±0.227
KIDNEY WEIGHT	L	1.082±0.1	0.7925±0.0725	0.7405±0.0575	0.872±0.106
	R	1.329±0.341	0.733±0.055	0.7445±0.0545	0.909±0.023
HEART WEIGHT		0.859±0.007	0.929±0.069	0.7685±0.0395	0.9955±0.0335
LUNGS WEIGHT		2.04±0.318	0.753±0.073	1.025±0.199	1.828±0.2005
TESTIS WEIGH		2.998±0.34	2.615±0.909	2.006±0.562	2.627±0.3995
UTERUS		0.3955±0.0265	0.4755±0.0505	0.385±0.035	0.753±0.027

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.

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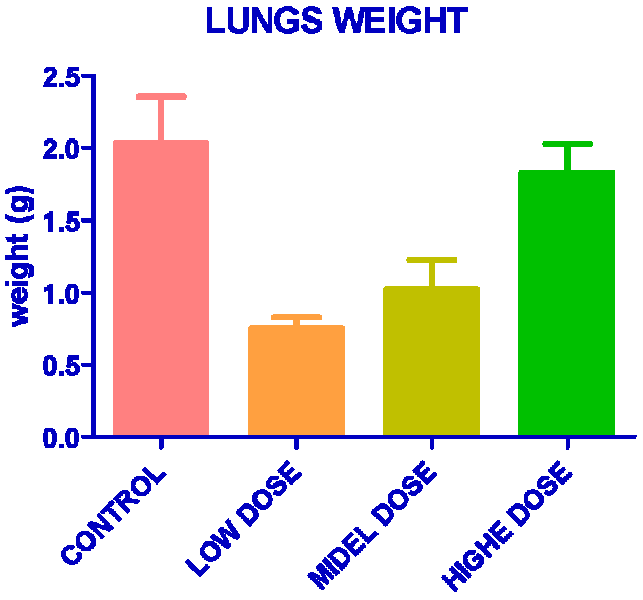
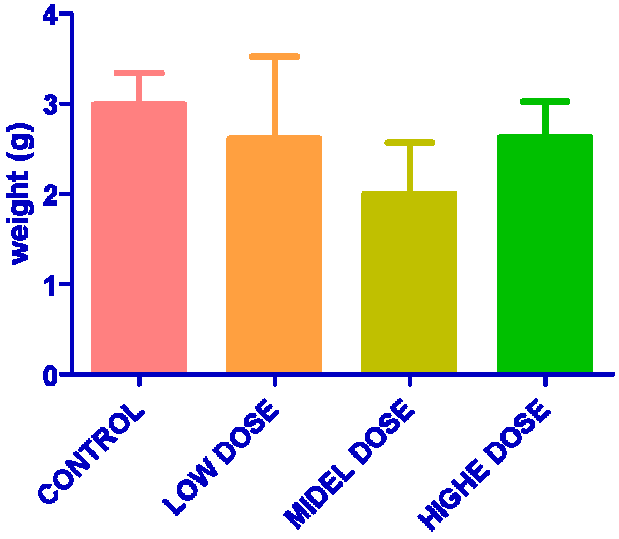
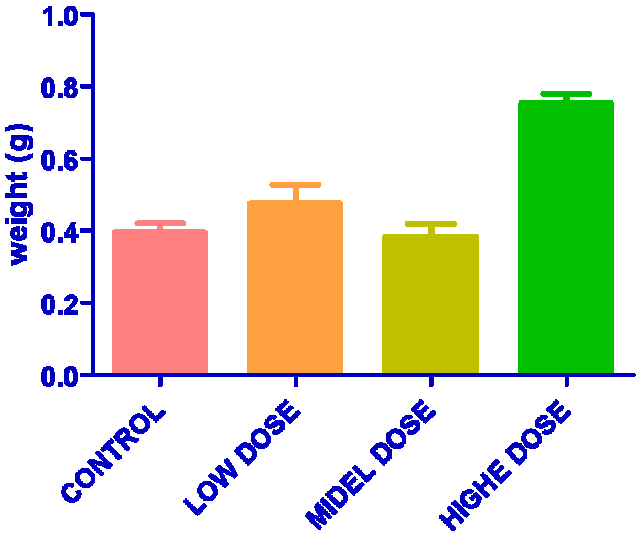
1.0
0.5
0.0
L
R
L
R
L
R
L
R


LUNGS WEIGHT
weight (g)
2.5
2.0
1.5
1.0
0.5
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

TESTIS WEIGHT



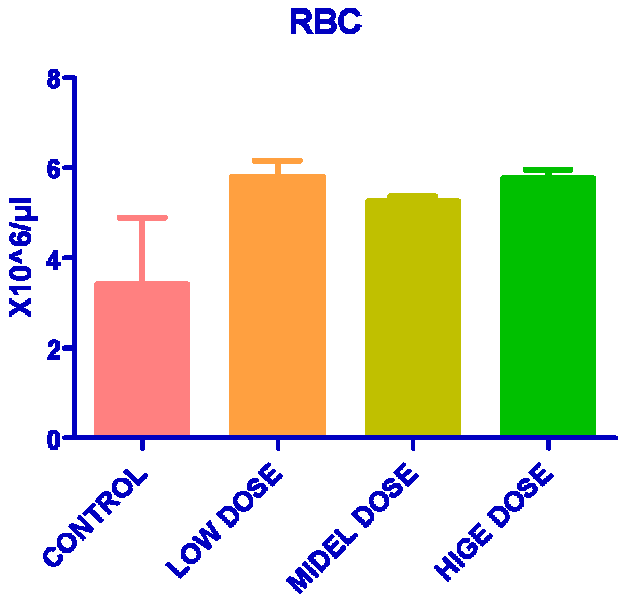
UTERUS

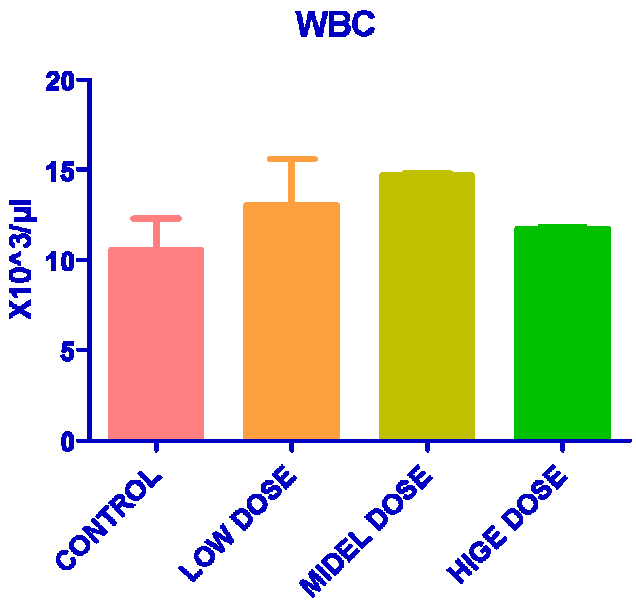


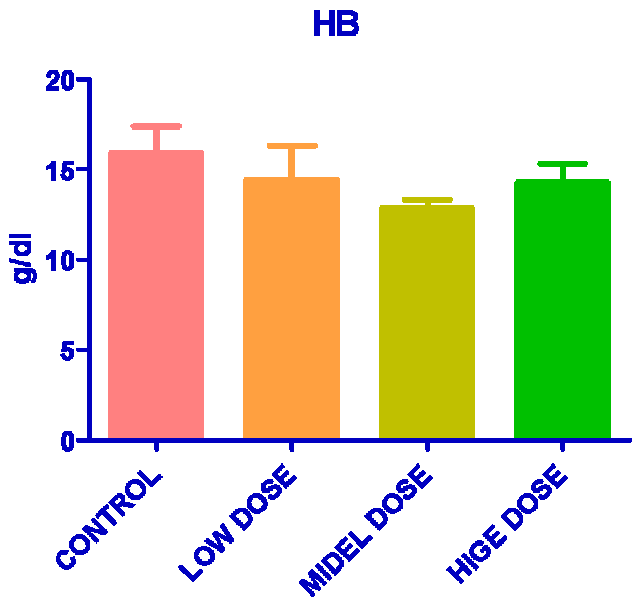
EFFECT OF SUB ACUTE DOSES (28 DAY) 0FSANTHUVATHA CHOORANAM WITH HOT WATER ON HAEMATOLOGICAL PARAMETERS

Groups	Control	Low Dose	Middle Dose	High Dose
Rbc ($X10^6$/µl)	3.41±1.495	5.795±0.3666	5.28±0.0866	5.765±0.1992
Wbc($X10^3$/µl)	10.55±1.75	13.05±2.55	14.7±0.1	11.75±0.05
Hb (g/dl)	15.9±1.5	14.4±1.9	12.85±0.45	14.25±1.05

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



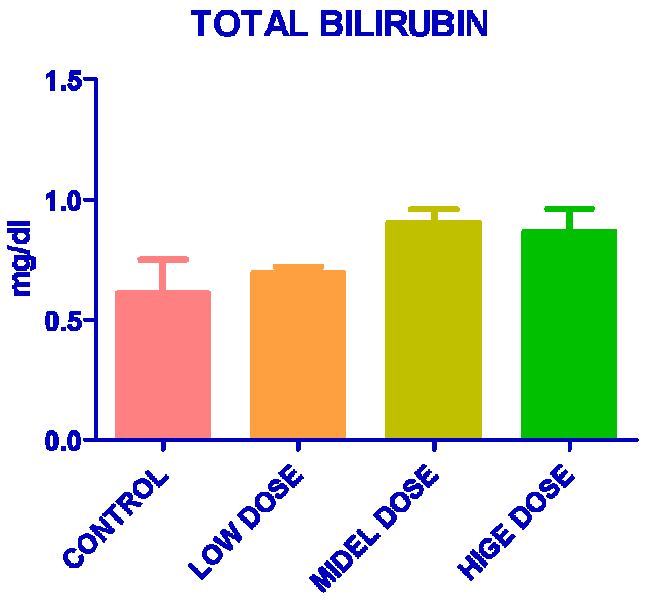

WBC
X10^3/µl
20
15
10
5
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


HB
g/dl
20
15
10
5
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

EFFECT OF SUB ACUTE DOSES (28 DAY) 0FSANTHUVATHA CHOORANAM WITH HOT WATER ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Total Bilirubin(mg/dl)	0.61±0.14	0.695±0.025	0.905±0.055	0.865±0.095

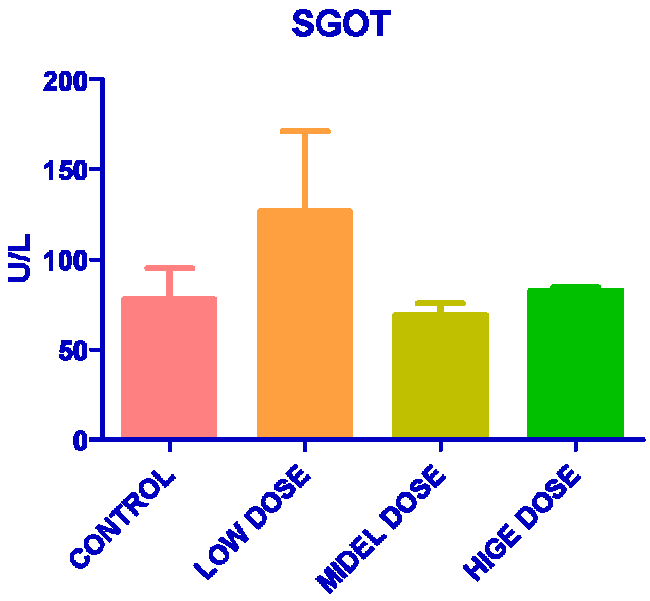
Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.

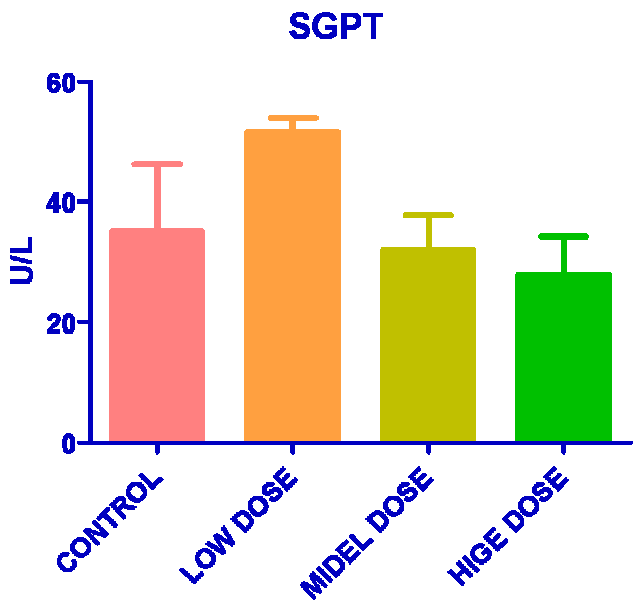


EFFECT OF SUB ACUTE DOSES (28 DAY) 0FSANTHUVATHA CHOORANAM WITH HOT WATER ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
SGOT (U/L)	78.25±16.95	126.8±44.35	69.4±6.4	82.55±1.85
SGPT (U/L)	35.19±11.12	51.55±2.35	32±5.7	27.85±6.35
ALP (U/L)	252.7±20	299.9±37.65	225.9±11.35	198.8±41.6

Values are expressed as the mean ± S.D; Statistical significance (p) calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.




SGPT
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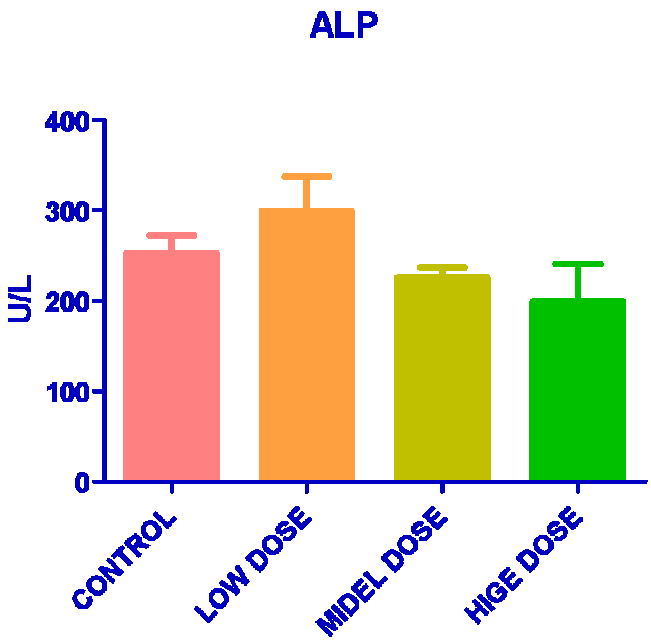
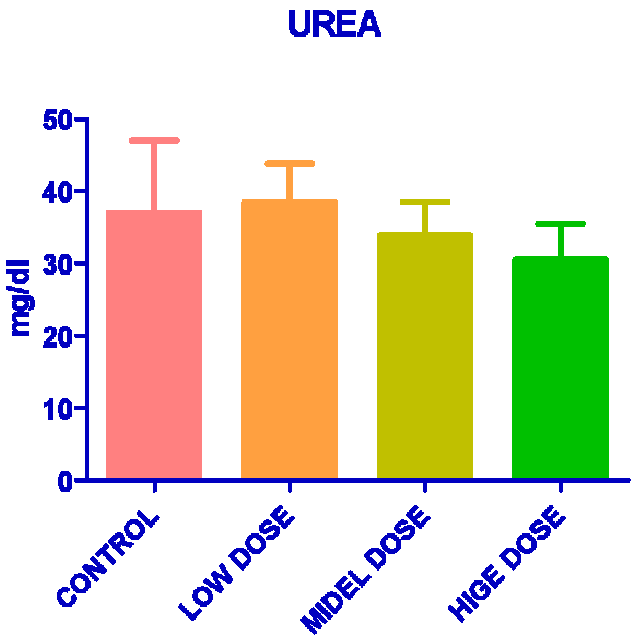
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


ALP
400
300
200
100
0
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

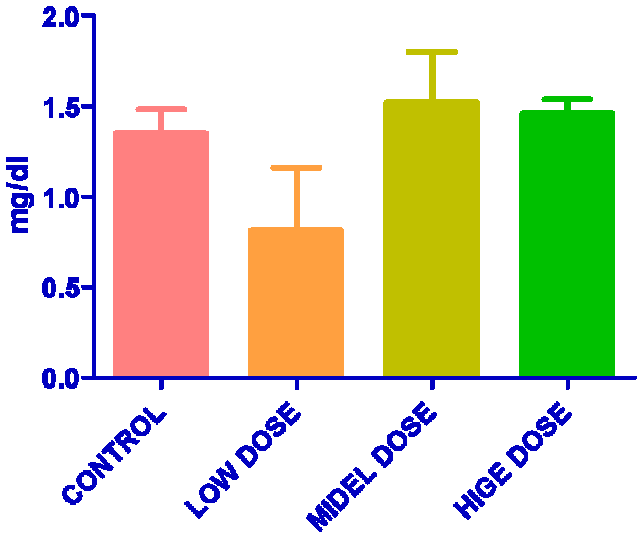
EFFECT OF SUB ACUTE DOSES (28 DAY) 0FSANTHUVATHA CHOORANAM WITH HOT WATER ON BIOCHEMICAL PARAMETER (KIDNEY PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Urea (mg/dl)	37.04±10	38.5±5.3	33.85±4.59	30.56±4.945
Uric acid (mg/dl)	1.35±0.13	0.81±0.35	1.52±0.28	1.46±0.08
Creatinine (mg/dl)	0.36±0.02	0.2±0.07	0.18±0.03	0.32±0.06

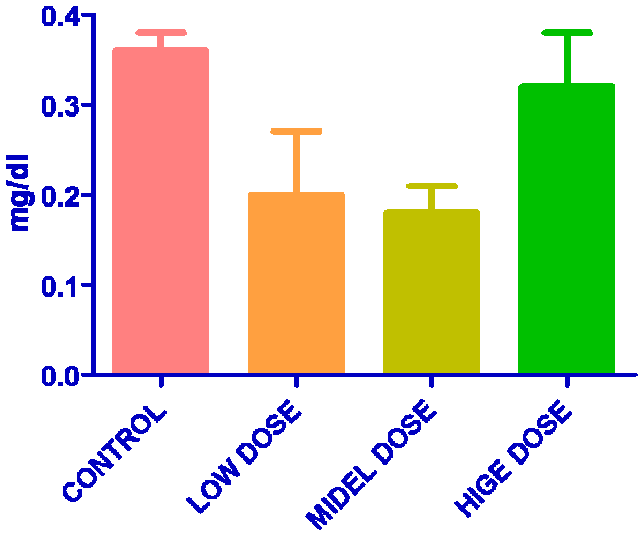
Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



URIC ACID



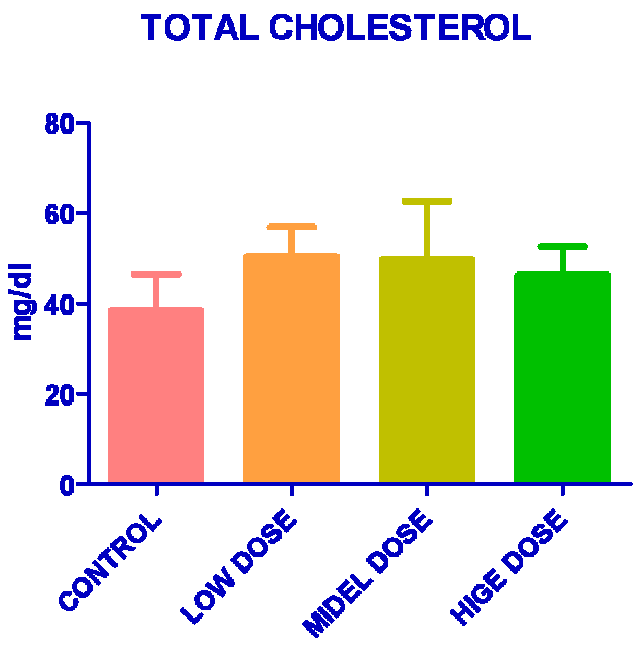
CREATININE

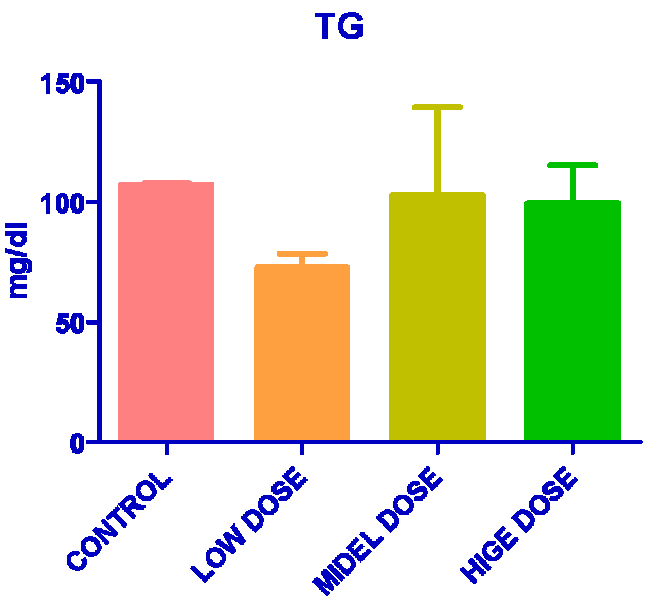


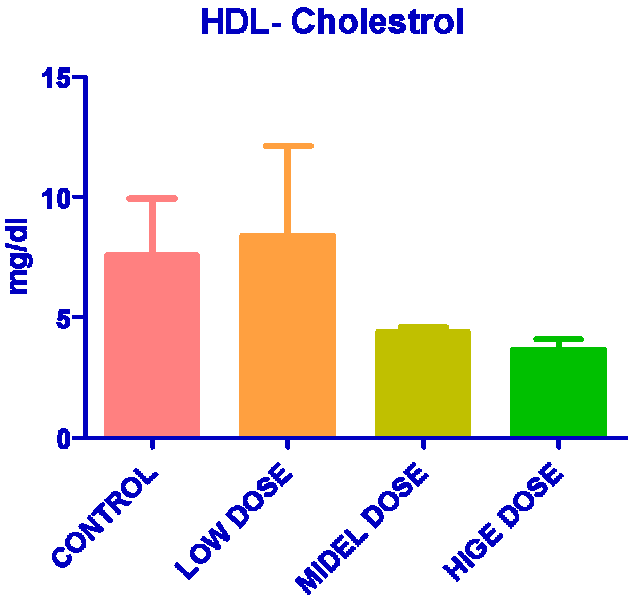
EFFECT OF SUB ACUTE DOSES (28 DAY) 0FSANTHUVATHA CHOORANAM WITH HOT WATER ON BIOCHEMICAL PARAMETER (LIPID PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Total cholesterol (mg/dl)	38.6±7.9	50.5±6.4	49.75±12.85	46.35±6.25
Triglycerides (mg/dl)	107.1±0.75	72.65±5.95	102.7±36.9	99.6±15.4
HDL-Cholesterol (mg/dl)	7.59±2.34	8.39±3.71	4.4±0.2	3.65±0.45

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.




TG
150
100
50
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


HDL- Cholestrol
15
10
5
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

RESULTS:

CLINICAL SIGNS:

All animals in this study were free of toxic clinical signs throughout the dosing period of 28 days.

Mortality:

All animals in control and in all the treated dose groups survived throughout the dosing period of 28 days.

Body weight:

Results of body weight determination of animals Table-1 from control and different dose groups exhibited comparable body weight gain throughout the dosing period of 28 days.

Food consumption:

During dosing and the post-dosing recovery period, the quantity of food consumed by animals from different dose groups was found to be comparable with that by control animals.

Organ Weight:

Group Mean Relative Organ Weights (% of body weight) are recorded in Table No.4 Comparison of organ weights of treated animals with respective control animals on day 29 was found to be comparable similarly.

Hematological investigations:

The results of hematological investigations (Table 4) conducted on day 29 revealed following significant changes in the values of different parameters investigated when compared with those of respective controls; however, the increase or decrease in the values obtained was within normal biological and laboratory limits or the effect was not dose dependent.

Biochemical Investigations:

Results of Biochemical investigations conducted on days 29 and recorded in Table 2 revealed the following significant changes in the values of hepatic serum enzymes studied. When compared with those of respective control. However, the increase or decrease in the values obtained was within normal biological and laboratory limits.

Histopathology:

In histopathological examination, revealed normal architecture in comparison with control and treated animal.

DISCUSSION:

1) All the animals from control and all the treated dose groups up to 500 mg/kg survived throughout the dosing period of 28 days.

2) No signs of toxicity were observed in animals from different dose groups during the dosing period of 28 days.

3) Animals from all the treated dose groups exhibited comparable body weight gain with that of controls throughout the dosing period of 28 days.

4) Food consumption of control and treated animals was found to be comparable throughout the dosing period of 28 days

5) Haematological analysis conducted at the end of the dosing period on day 29, revealed no abnormalities attributable to the treatment.

6) Biochemical analysis conducted at the end of the dosing period on day 29 no abnormalities attributable to the treatment.

7) Organ weight data of animals sacrificed at the end of the dosing period was found to be comparable with that of respective controls.

8) Histopathological examination revealed normal architecture in comparison with control and treated animal.

SUMMARY AND CONCLUSION:

In conclusion**SANTHUVATHA CHOORANAM WITH HOT WATER** can be considered safe, as it did not cause either any lethality or adverse changes with general behavior of rats and also there were no observable detrimental effects (100 to 300 mg/kg body weight) over a period of 28 days. Our results have demonstrated that the **SANTHUVATHA CHOORANAM WITH HOT WATER** is relatively safe when administered orally in rats.

9.0 ABBRVIATION

No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal Dose $_{50}$
p.o.	peros
mL	Milliliter
%	percentage
R&D	Research and Development
EDTA	Ethylene Diamine Tetra Acetic Acid

M	Male
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organisation of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals

EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON CARRAGEENAN-INDUCED LOCALISED INFLAMMATORY PAIN IN RATS

SUMMARY

The study plan was developed based on the guidelines of Vogel[1] and also it has reference to Chao Ma and Jun-Ming Zhang[2] and Walker et al. [3,]Winter CA, Risley EA, Nuss GW. Carrageenin induced edema in hind paw of the rat as an assay for anti-inflammatory drugs. Proc Soc Exp Biol Med. 1962;111:544–7.

OBJECTIVE

To study the anti-inflammatory effect of **SANTHUVATHA CHOORANAM** were prepared **with HOT WATER** in the rat model of Carrageenan-induced localized inflammation.

Methods:

Test System

Species	:	Rat
Strain	:	Albino Wister
Age	:	6-8 weeks at the time of dosing
Total no. of Rats	:	24
Sex	:	Male
Weight	:	150 gm

The animals were housed in polypropylene cages with stainless steel top grills having facilities for holding pellet food and drinking water in bottle with stainless steel sipper tube. Each cage contained 6 rats. All rats had free access to potable water and standard pelleted laboratory animal diet *ad libitum*. Paddy husk was used as bedding material. The animals were divided into 5 groups (6 rats/group). Localized inflammatory pain was induced in all groups of animals by intraplantar injection of carrageenan (50 µl of 3% suspension).

One day before the experiment, three basal readings of hind paw in each rat were recorded. Group 1 received vehicle orally, Group 2 received a standard drug Diclofenac sodium (10 mg/kg i.p), whereas groups 3,4and 5 received **SANTHUVATHA CHOORANAM**. The doses of **SANTHUVATHA CHOORANAM** were prepared **with HOT WATER**, whereas Diclofenac sodiumwas dissolved in normal saline.After 30 min, the rats were challenged with subcutaneous injection of 0.1 ml of 1% w/v solution of carrageenan into the sub

plantar region of left paw. The paw was marked with ink at the level of lateral malleolus and immersed in mercury up to the mark. The paw volume was measured at 0, 1, 2, 3, 4, 5 and 6^{th} hr after carrageenin injection using Digital Plethysmometer. The difference between initial and subsequent reading gave the actual edema volume.

CONVERSION FORMULA:

Human dose is 1000 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 150 gm of Rat

1000 mg x 2(a) x 0.018 (b) = 18 (c) /150 gm of Rat

18/1000x150 = 2.7 mg

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	--	1 ml
2	Therapeutic Dose	2.7 mg /kg	1 ml
3	Middle Dose	13.5mg/kg	1 ml
4	High Dose	67.5mg/kg	1 ml

EXPERIMENTAL DESIGN:

Group-I: Served as a negative control (0.1ml of 1% carrageenin)

Group-II: Served as standard received Diclofenac sodium (10mg/kg, i.p) + (0.1ml of 1% carrageenin)

Group-III: Received **SANTHUVATHA CHOORANAM** were prepared **with HOT WATER** (2.7 mg /kg) + (0.1ml of 1% carrageenin)

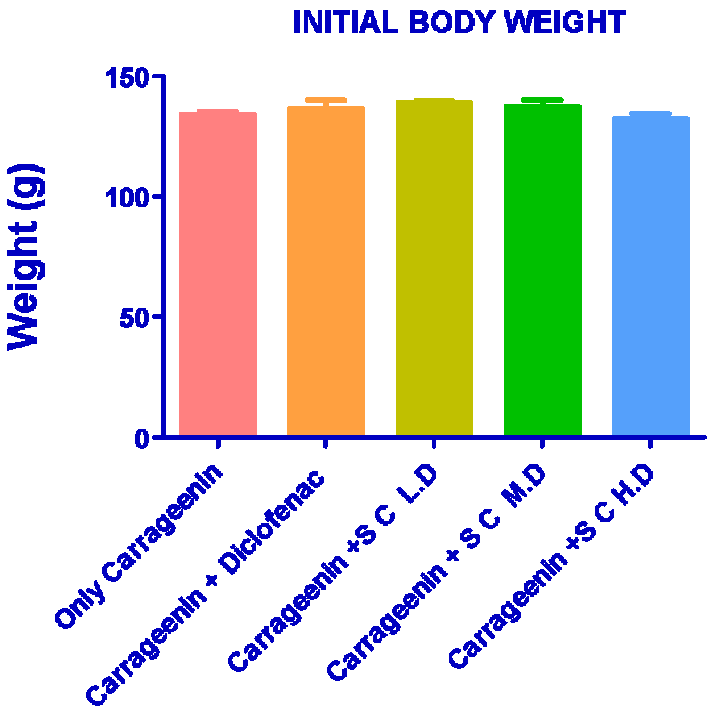
Group IV: Received **SANTHUVATHA CHOORANAM** were prepared **with HOT WATER** (13.5 mg/kg) + (0.1ml of 1% carrageenin)

Group V: Received **SANTHUVATHA CHOORANAM** were prepared **with HOT WATER** (67.5 mg/kg) + (0.1ml of 1% carrageenin)

TABLE: EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON Carrageenin -INDUCED PAW EDEMA IN RATS (BODY WEIGHT in gms)

Group	Only Carrageenan	Carrageenan+ Diclofenac 10mg/kg	Carrageenan + SC L.D	Carrageenan +SC M.D	Carrageenan+SC H.D
INITIAL BODY WEIGHT	134±1.155	136±4	138.7±0.8819	137±2.887	132±2.309

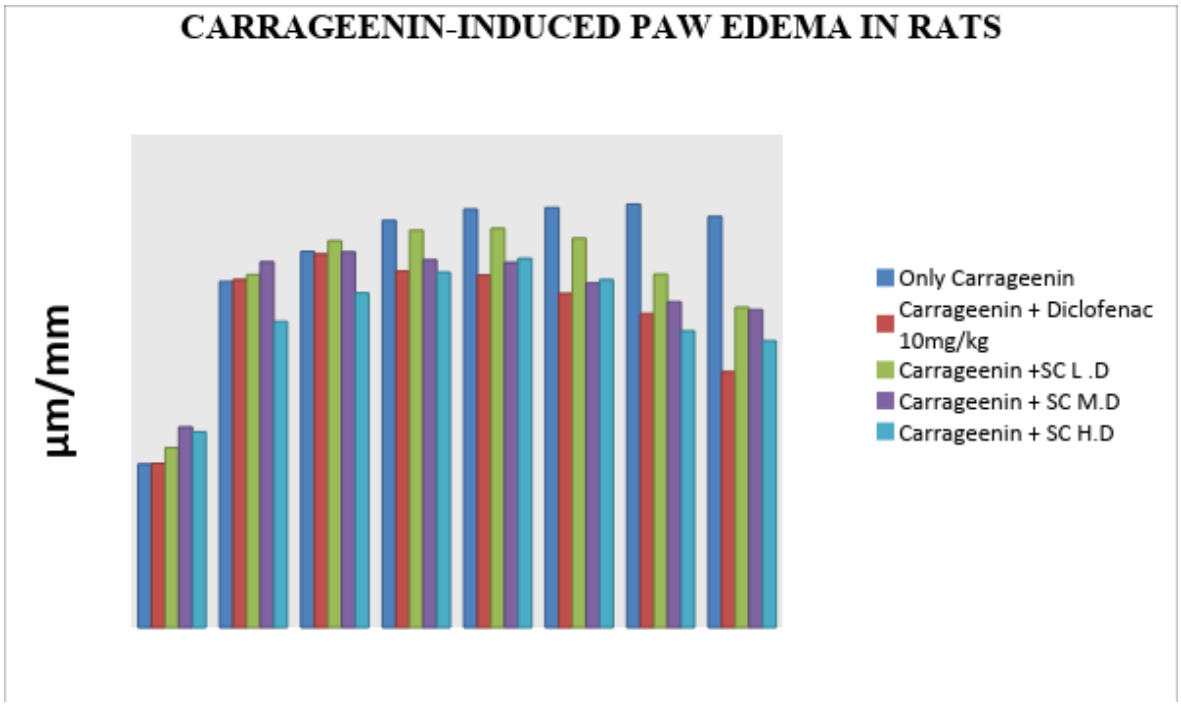
Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P< 0.05$ calculated by comparing treated group with control group



EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON Carrageenin -INDUCED PAW EDEMA IN RATS

Group	Mean paw volume before carrageenan injection	Paw Volume after induction with carrageenin Increase in paw volume (ml) after carrageenan injection (mean ± SEM)			Paw Volume after induction with carrageenin Increase in paw volume (ml) after carrageenan injection (mean ± SEM)			
	0 min	30 min	1hr	2hr	3h	4h	5h	6h
Only Carrageenan	3.37±0.054	7.02± 0.20	7.63±0.301	8.27± 0.30	8.49± 0.23	8.52±0.20	8.59±0.04	8.37±0.084
Carrageenan + Standard	3.33±0.068	7.06± 0.102	7.587± 0.168	7.2±0.061	7.15± 0.40*	6.78±0.083**	6.37±0.10***	5.13±0.16***
Carrageenan + SC L.D	3.67±0.13	7.16± 0.284	7.85±0.219	8.67± 0.37	8.1±0.36	7.907± 0.54	7.17±0.40**	6.57±0.29**
Carrageenan + SC M.D	4.06±0.35	7.42± 0.274	7.62±0.0731	7.47± 0.27	7.41± 0.12	6.99±0.24*	6.61±0.05***	6.45±0.33**
Carrageenan + SC H.D	3.97±0.37	6.21± 0.206	6.79±0.330	7.21± 0.22	7.49± 0.27	7.06±0.23*	6.07±0.17***	5.87±0.30***

Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P< 0.05$ calculated by comparing treated group with control group


CARRAGEENIN-INDUCED PAW EDEMA IN RATS
µm/mm
Only Carrageenin
Carrageenin + Diclofenac 10mg/kg
Carrageenin +SC L .D
Carrageenin + SC M.D
Carrageenin + SC H.D

EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON Carrageenin -INDUCED PAW EDEMA IN RATS

Only Carrageenin

Carrageenin+ STD

Carrageenin + SC L.D

Carrageenin+ SC M.D

Carrageenin+ SC H.D

EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON ACETIC ACID INDUCED WRITHING IN MICE[1]

1. Kaneria MS, Naik SR, Kohli RK. Anti-inflammatory,antiarthritic and analgesic activity of a herbal formulation. Indian J.Experimental Biol. 2007; 45: 279.

Acetic acid induced writhing method was adopted for evaluation of analgesic activity. Writhing is defined as a stretch, tension to one side, extension of hind legs, contraction of the abdomen so that the abdomen of mice touches the floor, turning of trunk (twist). Any writhing is considered as a positive response.

MATERIAL AND METHODS

ANIMALS:

Healthy Swiss albino rats of either sex weighing 20-25g were used in this study. All the animals were obtained from Animal house of the KMCH College of Pharmacy, Coimbatore. The animals were housed comfortably in a group of six in a single clean plastic cage with a metal frame lid on its top. They were housed under standard environmental conditions of temperature (24±1°C) and relative humidity of 30-70 %. A 12:12 h light dark cycle was followed. All animals had free access to water and standard pelletized laboratory animal diet ad libitum. All the experimental procedures and protocols used in this study were reviewed and approved via the Approval No. ---------- by the Institutional Animal Ethical Committee (IAEC) of KMCH College of Pharmacy, Coimbatore (685/PO/Re/S/2002/CPSCEA Dated 21st August 2002 constituted in accordance with the guidelines of the CPCSEA, Government of India.

DRUGS:

Acetic acid (Sigma Chemical Co. Bangalore, India) and Indomethacin were purchased from (Ranbaxy, India). All drugs were dissolved in saline. The different doses of **SANTHUVATHA CHOORANAM** were prepared **WITH HOT WATER**. The control group received vehicle as control. All drugs were prepared just before use.

PREPARATION OF ACETIC ACID:

A solution of acetic acid (1% v/v) in distilled water was prepared.

CONVERSION FORMULA:

Human dose is 1000 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 30 gm of Mice

1000 mg x 2(a) x 0.018 (b) = 18 (c) /30 gm of Mice

18/1000x30 = 0.54 mg

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	--	1 ml
2	Therapeutic Dose	0.54 mg /kg	1 ml
3	Middle Dose	2.7mg/kg	1 ml
4	High Dose	13.5mg/kg	1 ml

EXPERIMENTAL PROCEUDRE:

GROUP 1 – CONTROL (IP injection of 0.1 ml 1% acetic acid)

GROUP 2 -- IP injection of 0.1 ml 1% acetic acid +Indomethacin (5mg/kg, i.p)

GROUP 3 -- 0.1 ml 1% acetic acid (ip) + SANTHUVATHA CHOORANAM WITH HOT WATER **0.54MG /KG(PO)**

GROUP 4 -- 0.1 ml 1% acetic acid (ip) + SANTHUVATHA CHOORANAM WITH HOT WATER **2.7mg/Kg(Po)**

GROUP 5 -- 0.1 ml 1% acetic acid (ip) + SANTHUVATHA CHOORANAM WITH HOT WATER

13.5mg/kg(po)

PROCEDURE:

Wister albino mice of either sex were divided into five different groups each containing

Six animals, the animals were marked individually. Food was withdrawn 12 hours prior to drug

administration till completion of experiment. The animals were weighed and numbered appropriately. The test and standard drugs were given orally. After 60 minutes writhing was induced by intra-peritoneal injection of 1% acetic acid in volume of 0.1 ml/10g body weight. The writhing episodes were recorded for 30 minutes; stretching movements consisting of arching of the back, elongation of body and extension of hind limbs were counted.

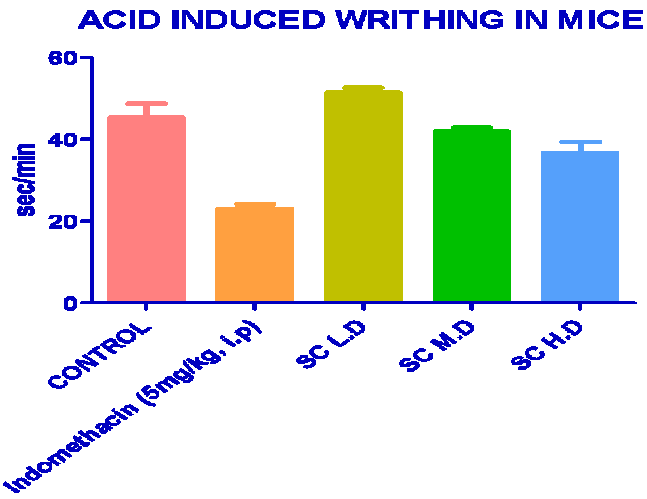
Anti-nociceptive activity was expressed as the percentage inhibition of abdominal constrictions using the ratio:

(Control mean – Treated mean) × 100/Control mean

EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON ACETIC ACID WRITHING IN MICE[1]

GROUP	No of Writhing (30min)	Inhibition (%)
CONTROL	45.25±3.4	----
Indomethacin (5mg/kg, i.p)	22.75±1.25	
SC 0.028mg/kg(po)	51.25±1.25	
SC 0.014mg/kg(po)	41.75±1.031	
SC 0.28mg/kg(po)	36.75±2.496	

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON HOT PLATE METHOD IN MICE[1]

1. Turner RA. Screening methods in pharmacology. In: Turner, R., Hebborn, P. (eds.). Academic press, New York. 1965; 100.

The paws of mice and rats are very sensitive to heat at temperatures which are not damaging the skin. The responses are jumping, withdrawal of the paws and licking of the paws.

MATERIAL AND METHODS

ANIMALS:

Healthy Swiss albino rats of either sex weighing 20-25g were used in this study. All the animals were obtained from Animal house of the KMCH College of Pharmacy, Coimbatore. The animals were housed comfortably in a group of six in a single clean plastic cage with a metal frame lid on its top. They were housed under standard environmental conditions of temperature (24±1°C) and relative humidity of 30-70 %. A 12:12 h light dark cycle was followed. All animals had free access to water and standard pelletized laboratory animal diet ad libitum. All the experimental procedures and protocols used in this study were reviewed and approved via the Approval No. ---------- by the Institutional Animal Ethical Committee (IAEC) of KMCH College of Pharmacy, Coimbatore (685/PO/Re/S/2002/CPSCEA Dated 21st August 2002 constituted in accordance with the guidelines of the CPCSEA, Government of India.

The hot plate, which is commercially available, consists of a electrically heated surface. The temperature is controlled for 55° to 56 °C. This can be a copper plate or a heated glass surface. The animals are placed on the hot plate and the time until either licking or jumping occurs is recorded by a stop-watch.

EXPERIMENTAL PROCEUDRE:

GROUP 1 – CONTROL

GROUP 2 –Pentazocine (10mg/kg, I.P)

GROUP 3 -- SANTHUVATHA CHOORANAM WITH HOT WATER **0.54 mg /kg(po)**

GROUP 4 – SANTHUVATHA CHOORANAM WITH HOT WATER **2.7mg/kg(po)**

GROUP 5 -- SANTHUVATHA CHOORANAM WITH HOT WATER **13.5mg/kg(po)**

PROCEUDRE:

Mice were screened by placing them on a hot plate maintained at 55±1ºC and recording the reaction time in seconds for forepaw licking or jumping. Only mice which reacted within 15sec and which did not show large variation when tested on four separate occasions, each 15min apart, were taken for the test. The time for forepaw licking or jumping on the heated plate of the analgesiometer maintains at 55ºC was taken as the reaction time. Prior to treatment, the reaction time of each mouse (licking of the forepaws or jumping response) was done at 0- and 10-min interval. The average of the two readings was obtained as the initial reaction time (*Tb*). The reaction time (*Ta*) following the administration of the ----------, Pentazocine and distilled water was measured at 0.5, 1, 2, and 3h after latency period of 30min.

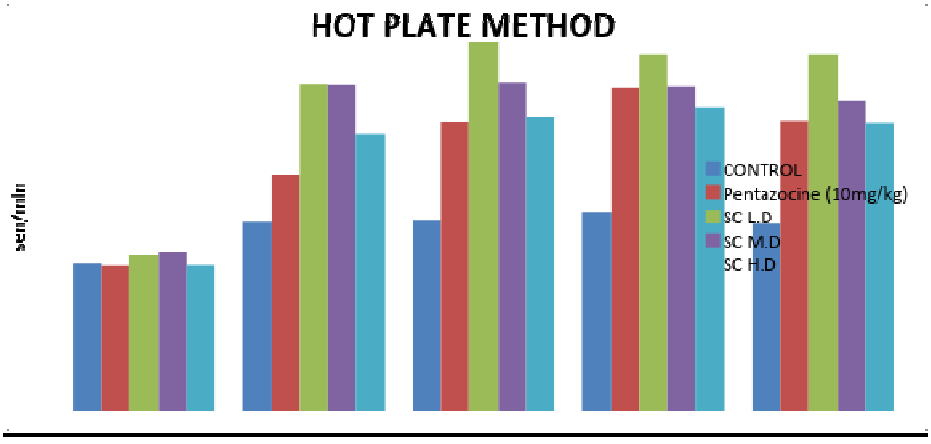
The following calculation was:

Percentage analgesic activity = $Ta\text{-}Tb/Tb \times 100$

EFFECT OF SANTHUVATHA CHOORANAM WITH HOT WATER ON HOT PLATE METHOD IN MICE[1]

GROUP	Reaction time in seconds at time (minutes) (mean ± sem) (mean ± sem)				
	O mints	60 mints	90 mints	120 mints	180 mints
CONTROL	3.413±0.1009	4.37±0.093	4.4±0.305	4.62±0.256	4.333±0.22
STANDARD	3.367±0.2035	5.483±0.296	6.69±0.191	7.47±0.303	6.707±0.18
S C + LOW DOSE	3.6±0.3602	7.563±0.292	8.573±0.326	8.26±0.417	8.263±0.18
SC + MIDDLE DOSE	3.657±0.06489	7.553±0.116	7.607±0.143	7.57±0.328	7.197±0.14
SC+ HIGH DOSE	3.37±0.1358	6.423±0.276	6.793±0.336	7.05±0.3	6.67±0.42

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's $^{***}P< 0.001$, $^{**}P < 0.01$, $^{*}P < 0.05$ calculated by comparing treated group with CONTROL group.



Name : **Ref. No. : [H0 335A/18]**	**Rec.On : 25/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

TOXICITY STUDY

SPECIMEN : A) Liver.

Group – : Kunthai – S.C.

GROSS APPEARANCE:

Received a specimen of liver measuring 3.4x2.4x1.5cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from liver shows altered lobular architecture with interface hepatitis. Individual Hepatocytes shows reactive atypia. Portal triad shows no significant pathology. Central vein shows congestion. Sinusoids show dilatation.

Dr.C.R.Ajeethkumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	**Rec.On : 25/03/2018**
Ref. No. : [H0 335B/17]	**Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : B) spleen.

Group – : Kunthai – S.C.

GROSS APPEARANCE:

Received a specimen of spleen measuring 2.4x0.8x0.4cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section studied from spleen shows normal white pulp and red pulp. Red pulp shows pigment laden macrophages and congested vessels. White pulp shows lymphocytic infiltrates forming germinal centre. The pencillar artery shows normal morphology. Megakaryocytes are seen.

Dr.C.R.Ajeeth kumar. M.D. (Path),

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	**Rec.On : 25/03/2018**
Ref. No. : [Ho 335C/18]	**Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **C) Kidney**.

Group – : Kunthai – S.C.

GROSS APPEARANCE :

Received specimen of kidneys each measuring 1.4x0.7x0.5cms and 1.3x0.6x0.4cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from kidney shows both cortex and medulla. Glomeruli shows mesangeal matrix expansion and focal hypercellularity (Less than 50%). Tubules show no significant pathology. Interstitium shows no significant pathology. Blood vessels show congestion.

Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:

Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	**Rec.On : 25/03/2018**
Ref. No. : [Ho 333D/18]	**Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **D) Testis**.

Group – : Kunthai – S.C.

GROSS APPEARANCE :

Received specimen of both testis measuring each 1.2x0.7x0.5cms and 1.0x0.5x0.4cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from testes with seminiferous tubules showing maturation arrest with lacking of spermatogenesis.

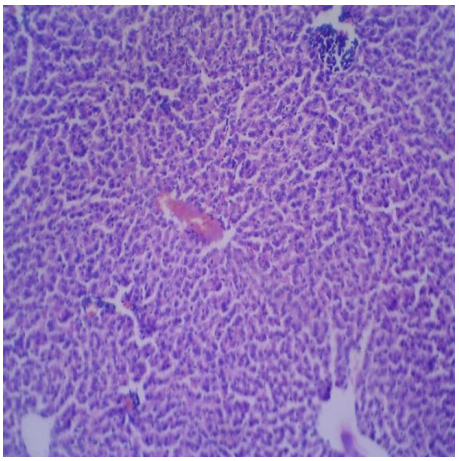
Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:

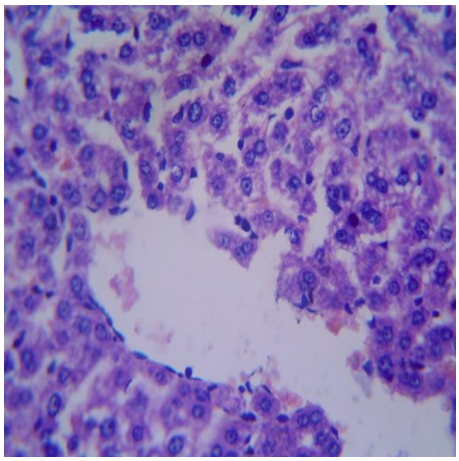
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

HISTOPATHOLOGY SLIDES

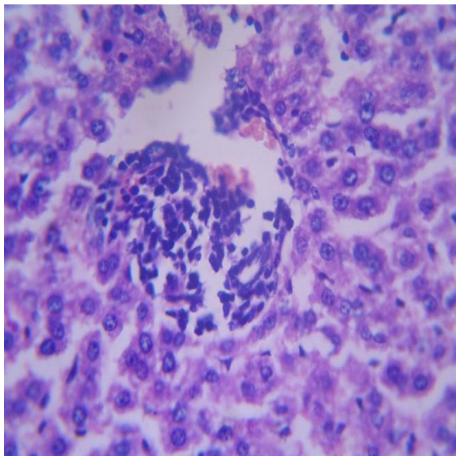
LIVER



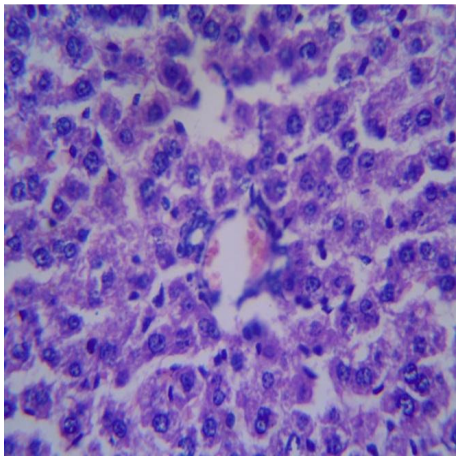
10X shows altered architecture



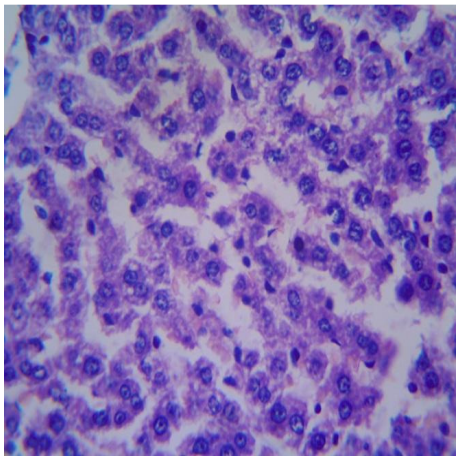
40X shows central vein dilatation and congestion



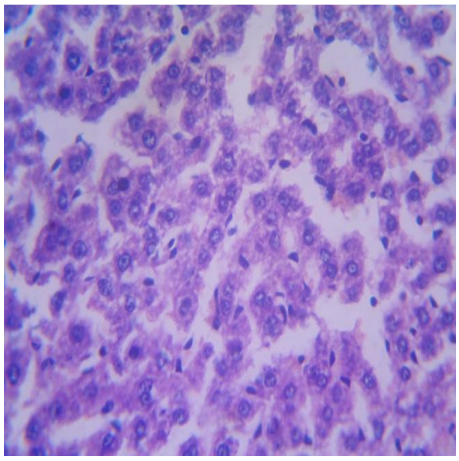
40X interface hepatitis



40X shows reactive atypia

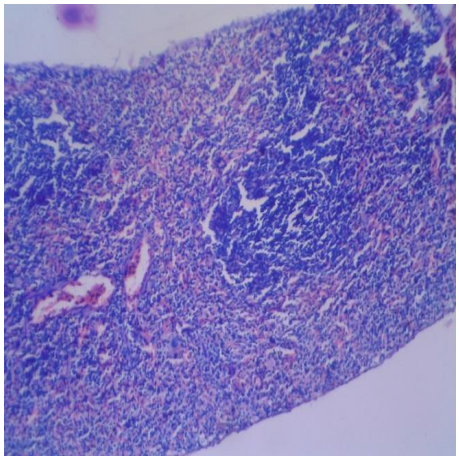


40 X shows sinusoidal dilatation

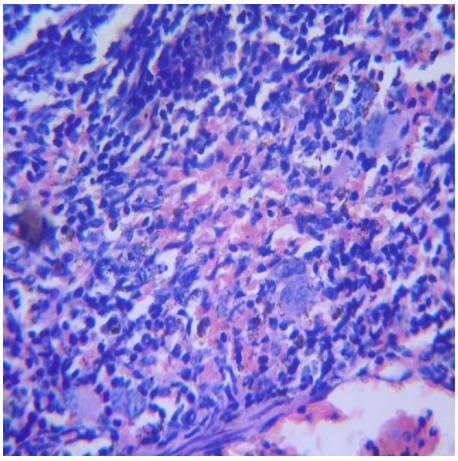


40X shows sinusoidal dilatation

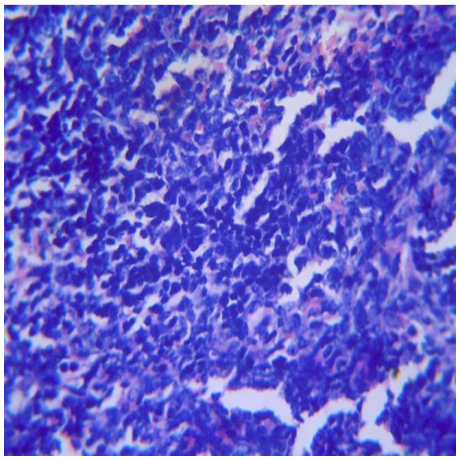
SPLEEN



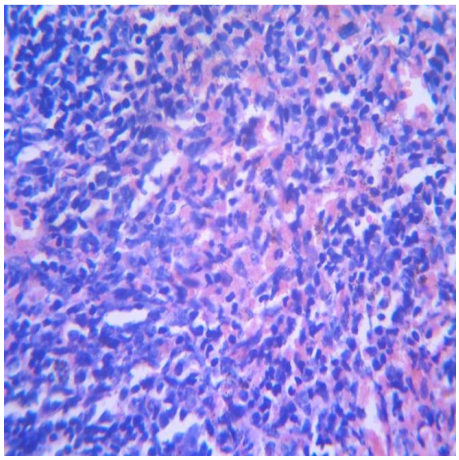
10X shows normal spleen



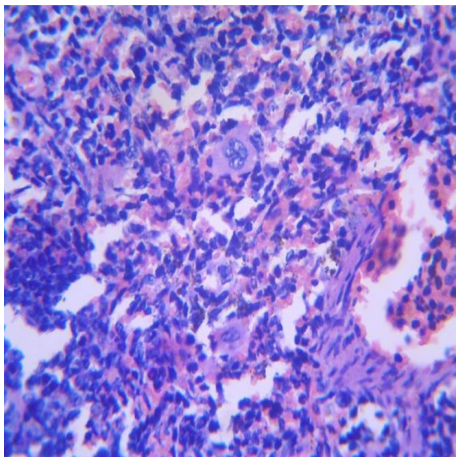
40 X shows megakaryocytes



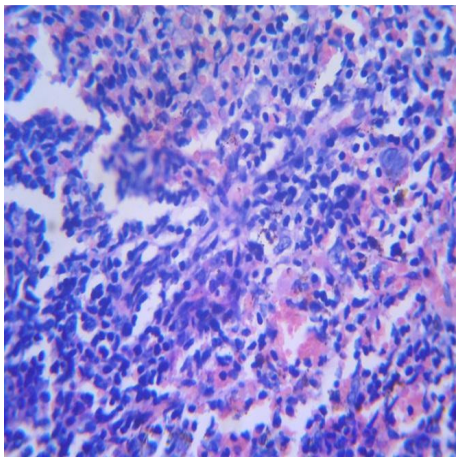
40X shows lymphocytic infiltrates



40X shows lymphocytic infiltrates red pulp congestion

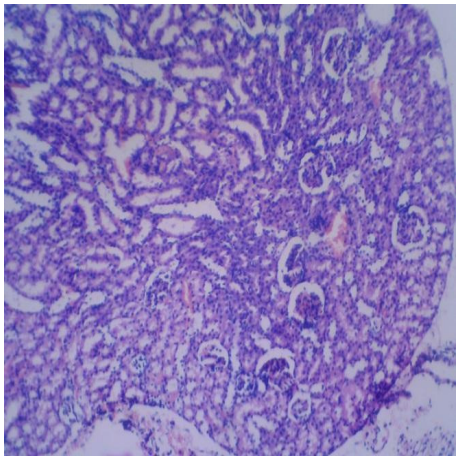


40X shows red pulp congestion

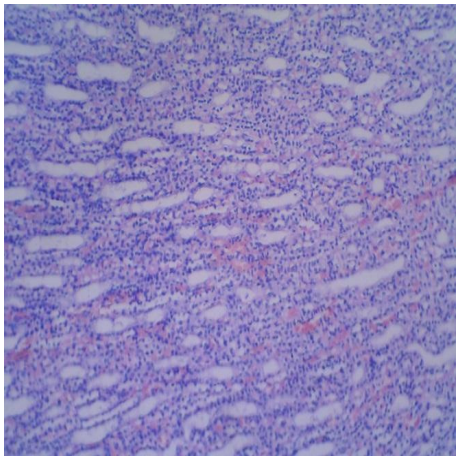


40X shows lymphocytic infiltrates

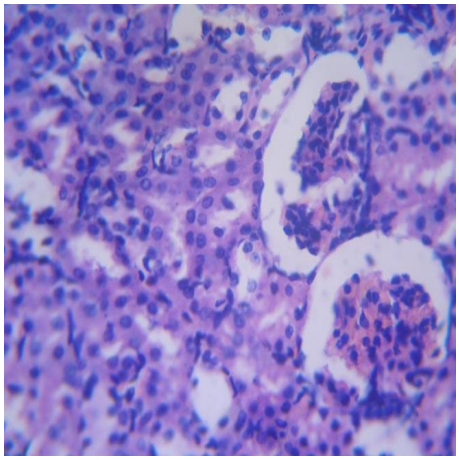
KIDNEY



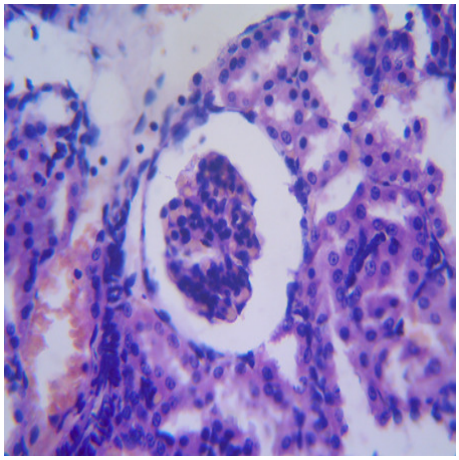
10 X shows global hyperplasia



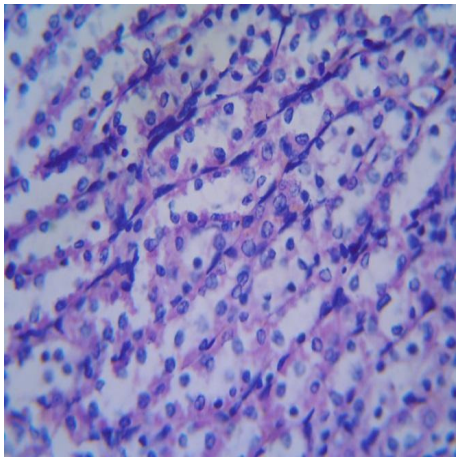
10X shows interstitium



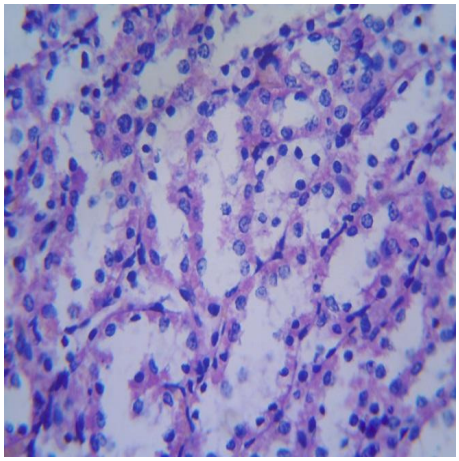
40 X shows hypercellularity



40 X shows mesangeal matrix expansion with hypercellularity

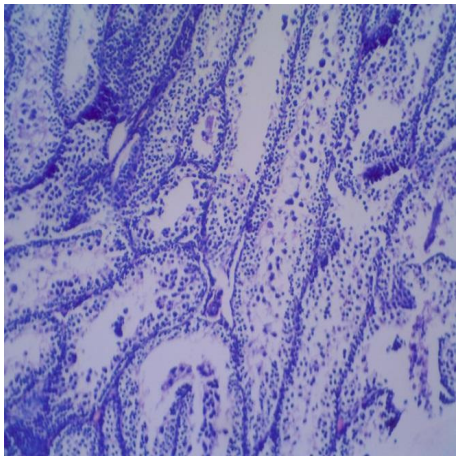


40X shows normal interstitium

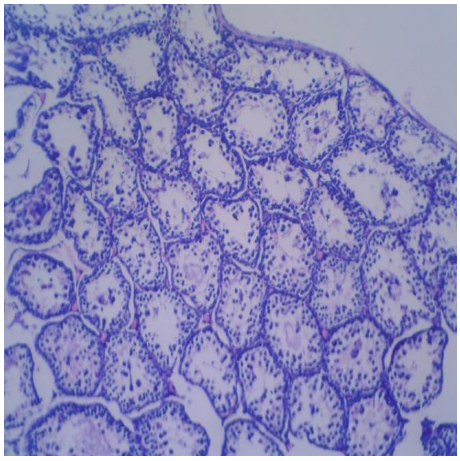


40X shows tubules

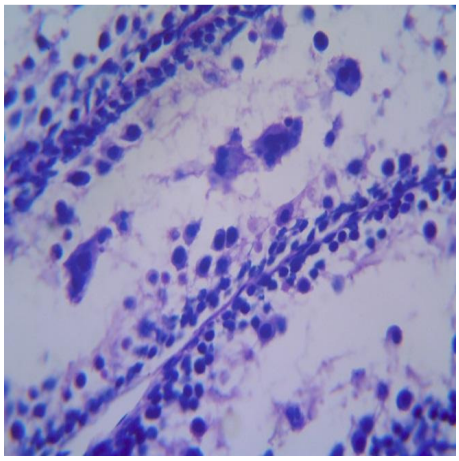
TESTIS



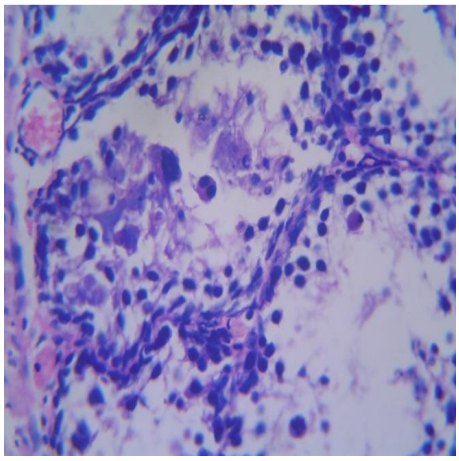
10 X shows maturation arrest



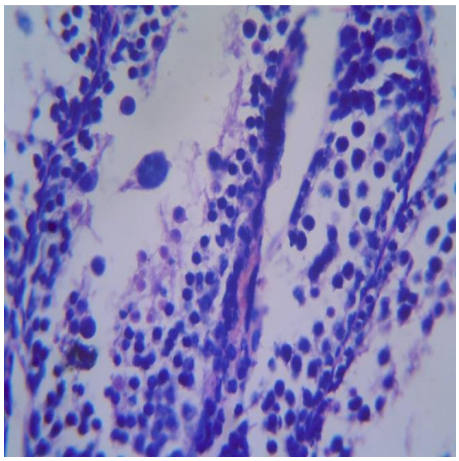
10 X shows maturation arrest



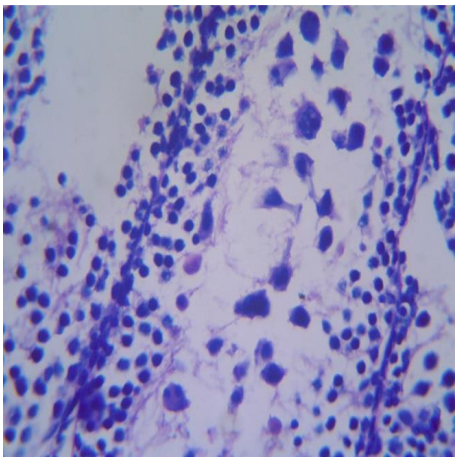
40X shows maturation arrest



40X shows maturation arrest



40X shows maturation arrest with no spermatogenesis



40X shows maturation arrest

ANNEXURE –V

ASSESSMENT FORMS

FORM I **:** Screening and Selection Proforma

FORM I A **:** History Proforma on Enrollment

FORM II : Clinical assessment on enrollment

FORM II A **:** Clinical assessment during and after trial

FORM III : Laboratory Investigation on enrollment and conclusion of trial

FORM IV : Consent Form

FORM IV B : Withdrawal form

FORM IV C : Patient information sheet

FORM IV D : Dietary Advice form

FORM IV E : Adverse Reaction form

FORM IV F : Discharge proforma

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BRANCH – III SIRAPPU MARUTHUVAM

A PILOT STUDY TO EVALUATE THE THERAPEUTIC EFFICACY OF SIDDHA FORMULATION "**SANTHUVATHA CHOORANAM** " INTERNAL & "**VATHA ENNAI**" EXTERNAL IN "**SANTHU VATHAM**" (POLYARTHRITIS).

FORM I – SCREENING & SELECTION PROFORMA

1. OP / IP NO : _____
2. NAME : _____
3. RELIGION : H / C / M / O
4. AGE / GENDER : _____
5. OCCUPATION : _____
6. INCOME : _____
7. CONTACT NO : _____
8. INCLUSION CRITERIA :

INCLUSION CRITERIA:

- Age : between 20- 60 years
- Sex : Both
- Joints pain : more than 5 joint
- Swelling
- Stiffness
- Restricted movements in affected joint.

Willing for admission and study in IPD for 40 days or willing to attend OPD

EXCLUSION CRITERIA:

- Rheumatic Fever
- Rheumatoid
- Gout
- Fracture
- Dislocation of joints

- Malignancy
- Use of narcotic drugs
- Pregnancy and Lactating women
- Tuberculosis
- Other systemic illness

ADMITTED TO TRIAL:

YES NO

If Yes Serial Number :

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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FORM I A – HISTORY PROFORMA

1. SL.NO : _____
2. OP / IP NO : _____
3. NAME : _____
4. RELIGION : H / C / M / O
5. AGE / GENDER : _____
6. OCCUPATION : _____
7. INCOME : _____
8. CONTACT NUMBER : _____
9. MARITAL STATUS : Married / Unmarried
10. COMPLAINTS & DURATION :

11. PERSONAL HISTORY:

PERSONAL HABITS	**YES**	**NO**	**IF YES SPECIFY DURATION**
Smoking			
Tobacco Chewing			
Alcohol			
Narcotic Drug Addiction			

12. DRUG HISTORY:

Whether the Patient has underwent any allopathic Treatment

1. Yes 2. No.

If yes specify the nature of the drug and treatment duration _____

13. FAMILY HISTORY:

Whether this problem runs in family?

1. Yes 2. No

If yes, mention the relationship of affected person(s)

1. _____

2. _____

14. DIETARY HABITS :

1. Pure vegetarian
2. Non-Vegetarian

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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FORM II AND II-A CLINICAL ASSESSMENT ON ENROLLMENT AND ON VISITS

1.	OP / IP No	:
2.	BED No	:
3.	SL. NO	:
4.	NAME	:
5.	AGE	:
6.	GENDER	:
7.	OCCUPATION	:
8.	SOCIAL STATUS	:
9.	DATE OF ADMISSION	:
10.	DATE OF DISCHARGE	:
11.	POSTAL ADDRESS	:
12.	COMPLAINTS & DURATION	:
13.	HISTORY OF PRESENT ILLNESS	:
14.	PAST HISTORY	:
15.	FAMILY HISTORY	:
16.	MENSTRUAL HISTORY (If Applicable):	
17.	**HABITS:**	
1.	Smoker	:
2.	Alcoholic	:
3.	Tobbaco chewer	:
4.	Betel nut chewer	:
5.	Non-Vegetarian	:
6.	Drug addiction	:

18. GENERAL EXAMINATION:

1. Body weight (Kg) :
2. Height (Cm) :
3. Body Temperature (F) :
4. Blood Pressure (mmHg) :
5. Pulse Rate (/min) :
6. Heart Rate (/min) :
7. Respiratory Rate (/min) :
8. Pallor :
9. Jaundice :
10. Clubbing :
11. Cyanosis :
12. Pedal Oedema :
13. Lymphadenopathy :
14. Jugular venous pulsation :

19. CLINICAL EXAMINATION:

I. INSPECTION:

1. Attitude :
2. Muscular spasm :
3. Muscle wasting – Proximal :
4. Muscle wasting – Distal :
5. Minor Joint Swelling :
6. Major Joint Swelling :
7. Nodules :
8. Deformity :

II. PALPATION:

1. Swelling :
2. Tenderness :
3. Joint Stiffness :
4. Muscle wasting :
5. Local heat :
6. Local Lymphadenopathy :

7. Pitting Oedema :

8. Nodules :

III. MOVEMENTS:

Restriction of joint movements

1. Neck : Full Partial
2. Shoulder :
3. Elbow joint :
4. Knee joint :
5. Ankle joint :
6. Hip joint :
7. Minor joints :

IV. PAIN:

1. Onset : Sudden : Gradual :
2. Early morning stiffness : Present : absent :
3. Nature of pain: Mild : Moderate : Severe:
4. Aggravating factor –Movements :
5. Relieving factor – rest :
6. Stiffness :
7. Tenderness :

V. CLINICAL ASSESSMENT :

1. Arthritis of three or more Joints :
2. Arthritis of hand joints :
3. Morning Stiffness :
4. Fever :
5. Anorexia :
6. Anaemia :
7. Spindle appearance of fingers :
8. Restricted movements :
9. Rheumatoid Nodules :
10. Numbness :

20. EXAMINATION OF OTHER SYSTEMS:

1. CVS :
2. RS :

3. CNS :

4. ABDOMEN :

5. GENITO – URINARY :

EXAMINATION – SIDDHA ASPECTS

1. NILAM:

1. Kurinji 2. Mullai 3. Marutham 4. Neithal 5. Paalai

2. KAALAM:

1. Kaar Kaalam 2. Koothir Kaalam 3. Munpani Kaalam

4. Pinpani Kaalam 5. Elavenir Kaalam 6. Mudhuvenir Kaalam

3. YAAKKAI:

1. Vatham 2. Pitham 3. Kabam

4. Vathapitham 5. Pithavatham 6. Kabavatham

7. Vathakabam 8. Pithakabam 9. Kabapitham

4. GUNAM:

1. Sathuvam 2. Rasatham 3. Thamasam

5. KANMENDHIRIUM / KANMAVIDAYAM

1. Kai :

2. Kaal :

3. Vaai :

4. Eruvaai :

5. Karuvaai :

6. UYIR THATHUKKAL:

I. VATHAM:

1. Piraanan :

2. Abaanan :

3. Viyaanan :

4. Uthaanan :

5. Samaanan :

6. Naagan :

7. Koorman :

8. Kirukaran :

9. Devathathan :

10. Dhananjeyan :

II. PITHAM :

1. Analagam :
2. Ranjagam :
3. Saathagam :
4. Aalosagam :
5. Praasagam :

III. KABAM:

1. Avalambagam :
2. Kilethagam :
3. Pothagam :
4. Tharpagam :
5. Santhigam :

7. UDAL THAATHUKKAL:

1. Saaram :
2. Senneer :
3. Oon :
4. Kozhuppu :
5. Enbu :
6. Moolai :
7. Sukkilam / Suronitham:

8. ENVAGAI THERVUGAL:

1. Naadi :
2. Sparisam :
3. Naa :
4. Niram :
5. Mozhi :
6. Vizhi :
7. Malam :

i. Niram: ii. Thanmai: iii. Irugal: iv.Ilagal:

8. Moothiram :

I. NEERKURI:

a. Niram :

b. Manam :

c. Edai :

d. Nurai :

e. Enjal :

II. NEIKURI:

Vatha Neer : Pittha Neer : Kaba Neer :

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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FORM III – LABORATORY INVESTIGATION

1. BLOOD:

1. TC : (Cells / Cumm)
2. DC (%) : N : L : M : E :
3. ESR (mm) : ½ hr : 1 hr :
4. Hb :
5. Blood Sugar : a) Fasting : b) Post Prandial :
6. Renal function tests:

   Blood Urea: Serum creatinine:
7. Lipid profile :

   HDL: LDL: VLDL:

   Total Cholesterol : TGL :
8. Liver Function tests:

   Serum Bilirubin : Total Direct Indirect

SPECIFIC INVESTIGATIONS

RA factor :

ASO titre :

C-Reactive Protein :

SGOT :

SGPT :

Serum albumin & globulin :

Total protein :

II. URINE:

1. Albumin :
2. Sugar :

3. Epithelial cells :

4. Pus cells :

5. Red blood cells :

6. Casts / Crystals :

III. MOTION:

1. Ova :

2. Cyst :

3. Occult blood :

4. Pus cells :

IV. X-RAY FINDINGS

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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FORM IV A – CONSENT FORM

CERTIFICATE BY INVEST INVESTIGATOR

I certify that I have disclosed all the details about the study in the terms readily understood by the patient.

Signature _____

Date _____

Name _____

CONSENT BY PATIENT

I have been informed to my satisfaction, by the attending physician, the purpose of the clinical trial, and the nature of drug treatment and follow-up including the laboratory investigations to be performed to monitor and safeguard my body functions.

I am aware of my right to opt out of the trial at any time during the course of the trial without having to give the reasons for doing so.

I exercising my free power of choice, hereby give my consent to be included as a subject in the clinical trial of "SANTHUVATHA CHOORANAM " (Internal drug) and "VATHA ENNAI" (External drug) for the treatment of "SANTHU VATHAM" (POLYARTHRITIS)".

Place :

Date :

Signature :

Name :

Witness Signature:

Name :

அரசினர் சித்த மருத்துவக் கல்லூரி மற்றும் மருத்துவமனை

பாளையங்கோட்டை

பட்டமேற்படிப்பு சிறப்பு மருத்துவத்துறை

‘சந்துவாத சூரணம்’’ மற்றும் ‘வாத எண்ணெய்’’ இவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்வு ஒப்புதல் படிவம் ஆய்வாளரால் சான்றளிக்கப்பட்டது.

நான் இந்த ஆய்வைக் குறித்த அனைத்து விபரங்களையும் நோயாளிக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி : கையொப்பம்:

இடம் : பெயர்:

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும் மருந்தின் தன்மை மற்றும் மருத்துவ வழிமுறையைப் பற்றியும் தொடர்ந்து எனது உடல் இயக்கத்தை கண்காணிக்கவும், அதனைப் பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றியும் திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின் போது காரணம் எதுவும் கூறாமல் எப்பொழுது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கின்றேன்.

நான் என்னுடைய சுதந்திரமாகத் தேர்வு செய்யும் உரிமையைக் கொண்டு **சந்து வாதம்** என்னும் நோய்க்கான **சந்துவாத சூரணம்** மற்றும் **வாத எண்ணெய்** ஆகியவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி : கையொப்பம்:

இடம் : பெயர் :

சாட்சிக்காரர் கையொப்பம்:

பெயர் :

GOVERNMENT SIDDHA MEDICAL COLLEGE & HOSPITAL

POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III SIRAPPU MARUTHUVAM

A PILOT STUDY TO EVALUATE THE THERAPEUTIC EFFICACY OF SIDDHA FORMULATION "**SANTHUVATHA CHOORANAM** " INTERNAL & "**VATHA ENNAI**" EXTERNAL IN "**SANTHU VATHAM**" (POLYARTHRITIS).

FORM IV – B - WITHDRAWAL FORM

1. SL.NO : _____
2. OP / IP NO : _____
3. NAME : _____
4. RELIGION : H / C / M / O
5. AGE / GENDER : _____
6. OCCUPATION : _____
7. SOCIAL STATUS : _____
8. CONTACT NO : _____
9. DATE OF TRIAL COMMENCEMENT : _____
10. DATE OF WITHDRAWAL FROM TRIAL : _____
11. REASONS FOR WITHDRAWAL : _____

- ➢ Long absence at reporting : Yes / No
- ➢ Irregular treatment : Yes / No
- ➢ Shift of locality : Yes / No
- ➢ Increase in severity of symptoms : Yes / No
- ➢ Development of severe adverse drug reactions: Yes / No

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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FORM – IV C DRUG COMPLIANCE FORM

Name of the Drug : SANTHUVATHA CHOORANAM

Drugs issued : (Mg / Gram)

Drugs returned : (Mg / Gram)

S. NO	**DATE**	**DRUG TAKEN TIME**	
		MORNING / TIME	**EVENING / TIME**
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			
Day 13			
Day 14			
Day 15			
Day 16			
Day 17			
Day 18			
Day 19			
Day 25			

Day 26			
Day 27			
Day 28			
Day 29			
Day 30			
Day 31			
Day 37			
Day 38			
Day 39			
Day 40			
Day 41			
Day 42			
Day 43			
Day 44			
Day 45			
Day 46			
Day 47			
Day 48			

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

BIBLIOGRAPHY

- Theraiyar Vagadam
- Essentials of orthopaedics and applied physiotherapy, Jayant Joshi, Prakash Kotwal, Published b
- Sarakku Suthi Muraigal
- Sarabenthirar Vaithiya Muraigal(Vatha Rogam)
- **KuppusamyMudaliar** Siddha Maruthuvam 7th edition Published by Departmentof Indian Medicine and Homeopathy, Govt. of Tamilnadu, Chennai , 2007.
- **Uthamarayan**Siddha MaruthuvaChurukkam Published by Govt. press, Govt. of Tamilnadu, Chennai 1953.
- **MurugesaMudaliar** C GunapadamMuligaiVaguppu Part I , 2ND edition, Published by Department of Indian Medicine and Homeopathy, Govt. of Tamilnadu, Chennai,2008.
- **Shanmugavelu M** Siddha MaruthuvaNoiNaadalNoimudalNaadalthiratu Part I Published by Department of Indian Medicine and Homeopathy, Govt. of Tamilnadu, Chennai,2008.
- **Nadkarni K.M** Indian MateriaMedica Volume I & II Published by Popular prakashampvt Bombay 1982.
- **Natarajan, Mayilvahanan**Natrajan Text Book of Orthopaedica and Traumatology Published M.M.OthopaedicHospital 4th edition Chennai, 1988.
- **Text book of basic and clinical orthopedics by M.N.Kumar**
- **ADAM'S outline of orthopedics 14 edition**
- Christopher et.all Davidson's Principles and Practice of Medicine, Elsevier Science Limited21st edition Year 2002.
- Bedside clinics in medicine part I by Arup kumar kundu ,6 th edition.
- Siddha and Metric Measurements by TKDL.Newdelhi.
- **Shanmugavelu** M Noigalukku Siddha Parikaram
- **Durirajan** K Noyillaneri
- **Udamarayan** Udalthathuvam.
- Theryarkarisal ,Theriyarvagadem
- **Thiruvalluvar**Thirukkural
- **Therayar**Neerkuri and Neikuri

- Siddha vaithyathirattu
- Agasthiyarvaithyasoothiram 650 (Page No 280, 281)
- **Sambasivampillai** T. V. dictionary
- Athmaratchamirtham (Page No 312)
- Yugi Vaithiya Sinthamani .(page no:87)
- Sarabendarar vaithiya muraigal(vatha roga sigichai)(page no:170)
- Thotrakirama araichiyum siddha maruthuva varalarum
- Hand book on thanuology
- Medicinal plants and raw drugs of india by purshotam kaushik and anil kumar dhimar
- Medicinal plants of india volume 2 Tamilnadu by S.N yoganarasimhan
- Tamil lexicon-Tamil English dictionary,vol-VI,published under the university of Madras,1992.
- Gunapadam thathu jeevam
- External therapies of siddha medicine by Dr.T.Thirunarayanan
- http://en.wikipedia.org/wiki/siddha
- www.siddhainfo.com
- www.tropical.theferns.info